THE BEE,

OR

LITERARY WEEKLY INTELLIGENCER,

FOR

WEDNESDAY, JULY 31. 1793.

HINTS FOR ESTABLISHING A SEMINARY OF EDUCATION ON A NEW PLAN.

J. A

Continued from p. 54. and concluded.

OF THE ACADEMY.

Or schoool for sciences and useful arts.

Natural History.

A GENERAL survey of the natural objects found on this globe, intended not only to afsist in the claſsification and nomenclature of these objects, but alſo, to give an idea of their properties and uses in nature, and arts. For the use of students in general.

Mineralogy,

Or the doctrine of foſsils. For the use of those who wiſh to make a particular study of this branch of natural history. Illustrated by specimens, and chemical experiments.

Zoology,

Or the doctrine of animals: not a dry system of claſsification only; but also to give an account of the habitudes and uses of the different animals, in food and in arts; and the method of catching thoſe that are useful, or of deſtroying ſuch as are hurtful to man.

Botany,

Or the doctrine of vegetables.

Meteorology.

The doctrine of meteors, including the doctrine of electricity, and the different kinds of air, from whoſe combinations and ſeparations are produced ſo many of thoſe phenomena which are reducible to this claſs.

Hydrography,

Or the doctrine of waters. Including the theory of tides, currents, *&c. &c.*

Of theſe branches of natural hiſtory, botany is the only one that has hitherto been ſeparately taught; though the others are at leaſt of equal importance.

The philoſophy of hiſtory.

Including philoſophical geography and chronology, connected with hiſtorical events.

From the want of a ſyſtematic arrangement in this branch of ſcience, hiſtory is in general a confuſed and uninteresting ſtudy to youth, in comparison of what it naturally ought to be. Here ſhould be given a general comprehenſive view of leading events, in which their connection with regard to time and place ſhould be ſo marked as to make an indelible

impreſsion on the youthful mind, and their mutual influence and relation to each other, so distinctly pointed out, as to make the connection of every *particular* historical event that ſhould afterwards occur, with the general train of other events, be readily recognised, so as to prevent that confusion of ideas, which alone renders history an uninteresting study to youth. In such a general course, the progreſs of the human mind, rather than the history of potentates and kings, ſhould be traced with fidelity and care.

Political Economy,

Or the philosophy of legislation. In this course ſhould be explained the principles of legislation as having reference to industry, arts, manufactures, agriculture, population, happineſs, and national wealth, as applicable to societies in their progreſs from rudeneſs to refinement, and in different situations, as to habits, manners, and circumstances.

In Britain, where every man may become an actual legislator, and where every one in his individual capacity is allowed to judge of the affairs of government, too much care cannot be taken, to render the sound principles of legislation generally known among all ranks of people in this island.

Antiquities.

Comprehending a review of the laws, manners, and customs; languages, arts, and sciences, of the different European nations in former times: as also the doctrine of coins, medals, inscriptions, and other

particulars, that tend to bring to light the knowledge of past events.

Asiatic literature.

Comprehending the languages, arts, and sciences of the different Asiatic nations.

Considering the intimate connection that Britain has at present with those nations, the utility of this course will be at first sight apparent.

Ethics,

Or the doctrine of mind. Metaphysics, moral philosophy.

Grammar,

Considered in its general principles, particularly as applied to the Engliſh language. This is a branch of science which has been so little adverted to by the moderns, and so much deference has been paid to the partial rules of ancient languages, as has involved the subject in perplexity and confuſion, which it is high time ſhould now be rectified

Logic.

On the improved plan, as by many it is taught at present; divested of those ſophyſtical ſubtleties which made the pride of the ſchools in the middle ages.

Rhetoric and the belles letters.

The law of nature and nations.

Civil law.

Including Engliſh law.

Divinity.

Church hiſtory.

Agriculture.

It appears surprising that an art so neceſsary for the well being of mankind in all ages, ſhould have been till of late, so totally overlooked in almost every system of education. Its advances have been slow in proportion to the neglect into which it has fallen, as an object of scientific inquiry. Since experiments have been made the test of truth, few facts have been thoroughly ascertained with regard to agriculture, because so much time is required for making one experiment, and so much care and nicety in the conducting them, that as these experiments usually come to be made by men who are not accustomed to the niceties of philosophic investigation, wrong conclusions are hastily drawn from ill ascertained facts. To point out the attentions that are neceſsary in making experiments; to select with care the few facts that have been thoroughly ascertained, from those which are only grounded on conjecture; to specify such decisive experiments as are neceſsary for elucidating doubtful points: and to inspire into the minds of those who meant to enter on such investigations, that cautious diffidence which the person who is in quest of important facts ſhould ever bear in mind, would form the principal buſineſs of this course.

Architecture.

Considered as an useful art, depending on mathematical and chemical principles, rather than as a *fine* art.

In modern times, so much attention has been beſtowed upon architecture, as an ornamental art, that the mathematical principles upon which it is founded,

have been in a great measure disregarded, and the contrivances that have been adopted in former times to give strength and stability to the fabric, along with certain internal conveniences, have been ridiculed as the monstrous innovations of barbarism and ignorance. Many structures which have been dignified with the stile of *Gothic*, as in scorn, while their stupendous magnificence extorts the reverential awe of the ignorant critic, who laughs at the absurdity of those parts of the structure which he deems monstrous and useleſs ornaments, owe their stability, together with that inexplicable magnificence of effect, to those very parts which instead of being useleſs ornaments, as the uninformed critic vainly supposes, are parts of the most indispensible utility. He knows not on what principles superadded weight can be made to contribute to apparent lightneſs, as well as real strength, and therefore presumptuously blames what he cannot comprehend. The very principles which constitute the strength of an arch, in different circumstances, have been so totally disregarded in architecture, as never yet to have been explained; so that the most glaring imperfections in this respect have been often earnestly recommended as eſsential improvements, and sometimes carried into actual practice in the construction of bridges. We cannot therefore too soon correct these hurtful absurdities, and therefore cannot make too much haste to institute the course of lectures here proposed.

Anatomy.

Theory of physic.

Practice of medicine.

Materia medica.

These branches of medical knowledge have been so long taught with good effect in Europe, that no farther explanation of them is neceſsary.

Pharmaceutic chemistry,

Or the doctrine of compounding medicines. This has hitherto been only incidentally taught as a particular part of the general course of chemistry. For obvious reasons it ſhould be separated into a distinct branch; many students have occasion for the one of these courses, who do not desire the other.

Surgery.

The veterenarian art,

Or the treatment of the diseases of domestic animals. This never has entered into the system of Britiſh education; though it is without dispute an object of great importance. Farriery is the only branch of it which is in any respect followed as a particular buſineſs in Britain. France had made great advances in eſtabliſhing a veterenarian school before the late troubles arose, which for a time, have suspended the progreſs of this and many other useful institutions. It is to be hoped, these will be again revived when peace ſhall be restored to that distracted country! Some feeble attempts have of late also been made to eſtabliſh a veterenary school in Britain, which we may hope will gradually attain a more perfect degree of stability.

These seem to be the principal branches of science, which in the present state of knowledge in Europe, appear to be neceſsary to be taught in a seminary of education, where it is intended to give full scope to the human mind in all its various deflections; as we advance in knowledge, other subjects of investigation will naturally arise, which may require additional means of elucidation, which will no doubt be adopted when the want is felt.

Mode of studying, and internal government.

As nature has, for wise purposes, given to the individuals among mankind, different powers, faculties, and tastes, in consequence of which one person attaches himself to one branch of science, exclusively in some measure to all others, who by studying that branch with ardour, puſhes his researches in it to the utmost stretch his faculties can carry him; while another, neglecting that branch, is equally ardent in prosecuting another: it follows, that in order to derive the full benefit from these exertions, no artificial restraints ought to be thrown in the way, to check this natural progreſs. Hence then we see the impropriety of prescribing any determined mode of study, to which, as of old, all the pupils must invariably adhere. Instead of this, every one ought to be left at perfect freedom to attend such of the profeſsors as ſhall be judged most proper for forwarding him in those studies that promise to lead most directly to the end in view. And as young men who are so far advanced in life as to be capable of engaging properly in scientific pursuits, must be supposed to be capable of exercising their

reasoning powers, no other compulsitor to study ought to be employed, but those of the evident *interest*, or inclination of the student. And as it is found by experience, that those things which are attained with much facility are disregarded, while what is purchased at a high price, is much prised, there ſhould be no such thing as gratuitous lectures to be given in this seminary, unleſs in such cases only, as where, from the peculiarities of the case, the teacher may think proper to make a present of a ticket to such as he ſhall deem deserving of it. Neither ought the fees for admiſsion to the lectures to be small, but proportioned to the general opulence of the country at the time. Nor ſhould these be arbitrary; both the *minimum* and the *maximum* ought to be fixed by the rules of the institution, and publicly known; which would be attended with many obvious consequences tending to preserve the dignity of the preceptors, and independence of the students. And if the fixed salaries of the preceptors were low, as in the university of Edinburgh, the office of a prefeſsor could never be desirable, unleſs to such men only as were proficients in the particular departments they were to teach, and who had a reasonable prospect of obtaining such a number of effective students as ſhould indemnify them for the trouble of giving lectures.

To insure against abuses in this department, however, perhaps some farther precautions might be neceſsary. Each profeſsor ſhould be required to deliver public lectures, five times a week, during each seſsion, which ſhould not be leſs than four or five

months; and these lectures to take up about an hour each in delivering; or if he neglected to do this his chair ſhould be declared vacant, and the place given to another.

To enforce these regulations, perhaps no better method needs be ſought for, than to appoint a PRINCIPAL, whoſe buſineſs it ſhould be to act as a cenſor over the conduct of the profeſſors; and who, by the aid of a *ſenatus concilium*, conſiſting of all the profeſſors without exception, might be authoriſed to admoniſh, ſuſpend, or depoſe any of the members of that body, who ſhould, by a majority of that council, be deemed worthy of ſuch puniſhments. The election to vacant places might be by the votes of a majority of the *ſenatus concilium*, with ſuch checks as ſhould be judged proper. One indiſpenſible requiſite for the office of the PRINCIPAL ſhould be, that he ought to reſide in the ſeminary always during the time of the ſeſſion. Perhaps a permiſſion of abſence for a ſhort time, might be granted on urgent occaſions; but the occaſion ought to be very urgent indeed, and ſhould perhaps never be granted for more than

weeks at a time; nor even that, without an *unanimous* vote of the members of the *ſenatus concilium*. The ruin of every literary, or religious inſtitution I have ſeen, commences with a negligence in the diſcharge of duties, in conſequence of the abſence of thoſe who ought to officiate: it cannot be therefore too much guarded againſt. Neither ought any one to be be permitted to teach by a deputy, unleſs in very particular caſes, and in

consequence of the permiſsion *unanimously* granted of the *senatus concilium.*

With regard to the place where such a seminary ought to be eſtabliſhed; it ought doubtleſs to be in the neighbourhood of the largest city in the state to which such an inſtitution belongs; for thus it would be rendered acceſsible to the greatest number of people, without deranging their affairs. In England, therefore, London is clearly the best place. And Edinburgh for Scotland.

Good substantial houses, (but not palaces,) with a garden to each, if poſsible, ſhould be provided for each profeſsor, and be perhaps the principal part, if not the whole of the fixed living. Adjoining to these ſhould be provided a suite of convenient lecturing rooms, and a museum and library; without which every seminary of education must be extremely incomplete. The museum ſhould be divided into departments suited to the claſses of lectures; each lecturer to be intrusted with the charge of the articles belonging to his own department. All the articles contained in each ſhould be inserted in a catalogue, and the whole ſhould be visited once a year by committee of the *senatus concilium*, aſsisted by certain other persons to be named for that purpose, who ſhould compare the articles with the catalogue, and see that nothing is destroyed or deranged. This visitation ought to be a great public act accompanied with particular ceremonies; and every student who had attended the seminary more than years, ſhould have a right to atttend at that visitation if he chose it.

For the support of the library and museum, a specified sum ſhould be paid by each student annually on his matriculation; in consequence of which he ſhould have a right to consult any book in the library, when it was open, under proper regulations, and to carry home such books as it might be judged safe to entrust out of the library, on depositing the price of the book with the librarian, to be got up when the book was returned. This regulation has been found to be a very proper one in the university of Edinburgh, where it has been adhered to for many years past. The profeſsors, too, ſhould have the use of books, but under certain regulations to prevent them from being too long detained in the poſseſsion of any one person. For purchasing books, a committee of three of the profeſsors ſhould exercise that office for one year, to follow in rotation regularly, so as include the whole.

These hints have already extended to too great a length for this Miscellany, and will by some be deemed of a nature too nearly approaching to Utopian, to be capable of being carried into practice. It would be easy however to ſhow that there is nothing either physically or morally impracticable in the plan, in a place of great extent; such as London, Paris, or any other great city, where, if able teachers were appointed, a sufficient number of students could easily be found to afford a reasonable compensation to literary men in all departments for their labour; and that by acting thus in concert, knowledge might be advanced to a much higher degree than it has yet attained, and the ac-

quisition of it be rendered much more easy, and less expensive than ever yet has been practicable. But on these heads I shall not enlarge, leaving every one at liberty to judge for himself.

Should ever such an institution however be attempted in England, care should be taken to secure to the present universities, their present exclusive privilege of conferring academical degrees; otherwise such an opposition would arise from that quarter, as must at once quash such a project. Indeed, at any rate, it may supposed, that the members of these antient institutions, who have long battened on the provision appropriated to idleness, by their ill judging forefathers, will behold with en evil eye, any proposal for establishing a literary seminary on principles so different from those which have been there adopted; and which, if encouraged, might tend to throw their venerable institutions into a comparative point of view, that would not tend to exalt them. It is thus that private considerations too often prevent the establishment of institutions of great utility; and the public may be said to be kept, with regard to literary attainments, in a perpetual state of pupilary nonage. Thus it has been since the beginning of time, and thus it will continue while this world lasts,—though now and then small advances may be made in spite of these checks which must operate continually though slowly in promoting improvements.

ON THE DIFFERENT VARIETIES OF SHEEP IN A WILD AND DOMESTIC STATE, REARED IN THE RUSSIAN EMPIRE, AND BY THE PASTORAL NATIONS FROM THE FRONTIERS OF EUROPE TO THOSE OF CHINA.

Continued from p. 91.

Domeſtic ſheep.

HAVING given an account of the argali or wild ſheep, I ſhall now enter upon Dr Pallas's remarks, made during his wide extended travels in the Ruſsian empire, more particularly in Seberia, and amongst the paſtoral nations of great Tartary, relative to the domeſtic ſheep.

The doctor found what he regards as only one ſpecies of ſheep in the whole range of his journey, ſubdivided into *four* varieties, and diſtinguiſhed by their tails, the form of their heads, their ears, and fleece. These four varieties are the long tailed, the ſhort tailed, the fat tailed, and a mixed breed of ſheep with longiſh tails, fat at the baſe, with a ſpecies of lean bony apendage tapering to a point. So that this able zoologiſt condemns as unfounded and fanciful, the erroneous idea of making *ſpecific* differences of the accidental varieties which education or mode of life, climate, food, and croſsing the breed, have produced in *ſheep*, as in pigeons, dogs, and other domeſtic animals; and in conformity to this opinion he conſiders the *ovis laticaudata*, *longicauda*, *pilosa*, *Africana*, *Guineensis*, *strepsiceros*, *Hungaria*,

nos, &c. of authors, as only accidental *varieties* of the same species of sheep; as he does the *capra Syriaca seu mambrina*, and all the other fanciful subdivisions of authors of the goat species, as only *varieties* of that animal.

However, it must be acknowledged, that Dr Pallas had opportunities in his extensive travels, of clearing up the doubts which prevented other naturalists before him, from deciding on that curious subject. It is well known, that if all the different kinds of sheep, or of any other animal, when the breeds are crossed in every possible direction, always generate a *prolific* stock, or in other words, produce young which are capable of propagating their species through *many* generations; in that case, there is no *specific* difference between them, and all the different kinds, however various they may be in form, &c. are only varieties of the sheep.

Whereas *different species* of any animal, although they may generate together, only produce a *barren* progeny which naturalists agree in naming mules, which cannot propagate their species through *many* generations; if we are even to give credit to those who pretend they have through two or three, in some singular cases, or rare instances.

Now Dr Pallas had an opportunity of convincing himself, that the long tailed, short tailed, fat tailed, and mixed Boucharian breed of sheep, the four varieties he treats of, all produce a prolific race, when crossed in every direction, and are *therefore* not different species.

The four varieties of domestic ſheep, which Dr Pallas examined on his travels, were,

1st. variety,

Is named both by the Tartars and Ruſsians, *Tscherkeſsian* ſheep, and by Pallas *dolichura*, or long tailed; it is the *ovis longicauda* of authors.

2d. Variety,

Is called the Ruſsian ſheep, by the natives, and by Pallas *brachiura* or ſhort tailed; it seems to be the *ovis Islandicus* of authors, with smaller horns.

3d. Variety,

Has no fixed trivial name, as its appellations are as various as the provinces where it is reared; Pallas has called it *steatopyga* or fat tailed; it is the *Ovis laticaudata* of authors.

4th. Variety,

Has likewise no fixed trivial name, but Pallas has called it *Bucharian*, from finding it reared by the Bucharian Tartars in immense flocks.

The first variety.

The TSCHERKESSIAN *ſheep of the Ruſsians and Tartars, the* OVIS DOLICHURA *of Pallas, and* OVIS LONGICAUDA *of authors.*

This variety is handsome with a noble air in its native country and the south of Ruſsia, resembling in its habits, horns, fleece, and length of tail, the Spaniſh, but more particularly the Engliſh ſheep. Its *head* is well proportioned, and of an elegant form; *ears* streight; *horns* large, even, rounded in the angles, tapering to a point, and bending inwardly towards

the back. The rams are seldom without horns, and the ewes have them often bent in a lunar form.

The *wool* though coarse is without admixture of hair*, and promises to be much meliorated by croſsing the breed, and rearing the animal with more care and ſkill.

It is even known to become much finer without the aſsistance of art, merely from the influence of a temperate climate, as on mount Caucasus.

The *tail* of the ram is covered with fine long wool, like the Indian ſheep described by Buffon, which trails on the ground, so as to efface the prints made by the animal's feet on sand; and it contains often twenty joints or vertebræ.

This variety of ſheep seems to have quitted with its coarse fleece and all its native ferocity, in paſsing from the state of nature to that of servitude; as it is the mildest gentle animal poſsible, although leſs degenerated in *form* from the *argali* or *muſimon*, the parent animal of the species, than the steatopyga or fat tailed, which has at the same time preserved much more of its wildneſs than the gentle Tscherkeſ-

* It appears to me, that the having no hair among the wool is not a specific, but merely an accidental distinction. We know well that among the varieties of ſheep common in England, and every other European country, there are found many which have hairs among their fleece, while it is only the selected *breeds* that have none. This variation, which has probably been at first accidental, like many other varieties among domestic animals, becomes in some measure permanent, by carefully excluding other varieties from intermixing with the selected breed, as will be more fully proved in the sequel of this eſsay. *Edit.*

sian, probably from its ranging with very little restraint the wide plains of great Tartary.

The Tscherkesian or long tailed sheep, (which is always the subject of this article,) is reared in all the European regions of the Russian empire, situated on this side the river Occa,—in the nearer Poland, and by the pastoral people of mount Caucasus; and they are commonly of a white colour.

The same variety, we are told by Russell, in his natural history of Aleppo, is reared under the name of *Beduin sheep*, by the Arabs, and in the western parts of Mauritania; with a trifling difference in the length and thickness of the *tail*. There are likewise sheep in Morocco which belong to this variety, on account of the distinguishing character of it, *a long tail*, although otherways different in having an ugly look,—*head* covered intirely with hair, little hanging *ears*, and remarkably long wool.

The doctor has himself seen sheep answering to the last description, in Germany; probably from a mixture of those of Flanders, with some foreign variety.

The Indian and Guinea sheep, so well described by Buffon, resemble the Tscherkesian only in the length of their *tail*, whilst in other respects, they come nearer the steatopyga or fat rumped sheep of Pallas, in size, form, and fleece mixed with *hair*.

Arid burning deserts seem to produce this change on the *wool*; as it is observed principally in the Atlantic deserts near the meridian, from which the sheep being transported to still warmer situations in America, have multiplied considerably, but mostly

without horns, and have now a covering of *hair* instead of wool. As a further confirmation of torrid deserts turning wool into hair, the doctor cites Shaw's travels, where that author tells us, that the sheep in the Shara desert of Africa, are commonly of the height of a doe, and covered with *hair* like that of a dog; and another traveller, the abbé Demanent, asserts in his new history of Africa, published at Paris in 1767, that two varieties of sheep are reared in Guinea, one of which is covered with *wool*, with a long fat tail (the fat probably accidental) whilst the other is larger, stronger, and covered with shaggy hair, like a goat. It is very good eating, although the most common, and least valued. Dr Pallas draws a double inference from this quotation from the abbé, *viz.* that the first of the two varieties, which is evidently the Tscherkesian, from the *long tail*, shows that it is widely dispersed over the earth, more or less affected by climate, soil, and sometimes by admixture of other breeds; whilst the second of the abbé's varieties, covered with shaggy hair, is another confirmation of what the doctor advanced above, that burning deserts turn *wool to hair;* and here he ends his proofs of that fact, which does not seem to require further confirmation*. Dr Pallas finished the description of

* There seems to be something unsatisfactory in the reasoning here. Were heat of climate the only cause of wool being converted into hair, it ought to operate equally on the two kinds of sheep here mentioned: and they ought to be both alike covered with hair or with wool. Perhaps in the course of this essay, some hints may occur tending to clear up this and other difficulties *Edit.*

this variety, with the following curious piece of information.

Tscherkeſsian lamb ſkins.

There is a valuable traffic carried on in the north, with the *ſkins* of the Tscherkeſsian lambs; the beauty of which they heighten in the following manner:

The inhabitants of the Ukrain and Podoli, as soon as a lamb is dropped, (which comes into the world with a pretty wavy ſkin, even without the aſsistance of art,) to augment its beauty, and make it bring a higher price, sew it up in a sort of coarse linen ſhirt, so as to keep up a constant gentle preſsure on the wool, pouring warm water over it every day, to make it soft and sleek; only letting out the bandage a little, from time to time, as the animal increases in size, but still keeping it tight enough to effect their purpose, which is, to lay the *wool* in beautiful gloſsy ringlets, and thereby produce a delicate species of fur, in great request for lining clothes, and morning gowns. By this treatment the fine soft wool which rises in the infancy of the lamb, takes a handsome arrangement; and the animal is killed younger or older according to the species of fur intended to be produced, from a ſhort gloſsy nap like sattin, only fit, from its thinneſs, for the purposes mentioned above, to a warm thick fur for a winter great coat. The first of these furs in estimation and price, is a fine black that looks like silk damaſk; an inferior black fur comes next, much thicker, for *pelices* or *ſhubes*, as we call the upper winter

garb worn out of doors; and the least in estimation is the whitish, except it be of a very pure colour and silky appearance, when it is a rival to the first; especially for night gowns, a very common dress, both morning and evening, amongst the Russians, particularly in the interior parts of the empire*.

To be continued.

* It appears from books of ancient travels, that this curious kind of lamb's fur has been long an article of traffic, and in great request in those countries; and we learn from this instance, that the people are neither inattentive to the elegancies of life, nor incapable of availing themselves, by their ingenuity and application, of those blessings that Heaven has thrown in their way.

It appears from these notices, that either there is a diversity of colours among this breed of sheep, or that the wool is stained, so as to assume the colours above mentioned. The first seems the most probable; for if it were done by art, they could obtain the black furs in any quantities, as well as those of every other colour, if the original wool be of a pure white. It would seem that this fine white is rather uncommon, and that when it does occur it is very much prised.

The silky gloss here mentioned, has a nearer resemblance to hair than to wool in its usual state. Among the great diversity of breeds of sheep in this country, there are some which carry crisped wool frizzled up, as it would seem nearly in the same manner as African negroe's hair. Other breeds carry lank wool, hanging streight down in locks, nearly as goats hair: while in other cases, though the filaments be parallel to each other, and by no means frizzled in their natural state, yet these locks are gently waved, as if they had been done up by pincers. This is the case with most of the Shetland breed of sheep. It is probable the wool of the lambs here mentioned may resemble these. It would tend much to the increase of knowledge, could some genuine specimens of these furs, and other skins of sheep of the most valuable breeds in different parts of the world, so dressed as to preserve the fleece entire, when at its full growth, be procured, and deposited in the museums of natural history all over Europe; and the Editor of this Miscellany will be much obliged to such of his correspondents abroad, into whose hands this

STRICTURES ON MANNERS.

Continued from vol. iii. p. 239.

Part II.

Manners of the Engliſh after the Norman conquest.

The most striking instance of barbarity we find upon record, in the manners of our ancestors, was the common, though horrid practice, of selling themſelves, their children, or kindred, into ſlavery; a practice common to all the German nations, and long continued by the natives of this island.

may fall, for ſuch ſpecimens as may come in their way, accompanied with a deſcription of the place where found, the time when obtained, and every other particular that appears to them to be of importance. Nor does he wiſh that this ſhould be confined to ſheep only, but to that of goats alſo; eſpecially thoſe like the Angora goat, which carry a fleece of great value; as alſo of the camel tribe, or other domeſtic fur-bearing animals. He has ſeen a ſpecimen of a kind of hair, or wool, ſaid to have come from Peru, that is evidently the fleece of an animal of conſiderable ſize. The filament has none of that criſpineſs, that is a general characteriſtic of wool; but it is long, ſleek, and gloſſy, like hair, though it has the ſoftneſs of wool, or rather of ſilk. The longeſt, and coarſeſt of that wool meaſures more than a foot in length, and is of a fawn coloured tinge, reſembling that of Vigonia wool, but lighter. The finer parts of the wool are white, and though long, is ſtill ſhorter than the other; and remarkably ſoft and ſilky; even more ſo than Shetland wool. Any notices concerning the animal that carries this fleece would prove highly acceptable. *Edit.*

Men, in that uncivilized age, not daring to rely on the protection of the laws, were obliged to devote themselves to the service of some chieftain, whose orders they followed even to the disturbance of the government, or the injury of their fellow citizens, and who afforded them in return protection from any insult or injury from strangers.

Hence we find, that almost all the inhabitants, even of burroughs, had placed themselves under the protection of some particular nobleman, whose patronage they purchased by annual payments, and whom they considered as their sovereign more than the king himself; and so much was one of these supposed to belong to his patron, that his murderer was obliged by law to pay a fine to the latter, as a compensation for his loſs.—The inhabitants of some towns were even in a more servile state; being altogether under the absolute power of the king, or some temporal lord or abbot:—And in this case, they were at the disposal of their lords, (whether king or subject,) without whose consent they could not devise their estates even to their own children. "The kings of England, (says Mr Madox, writing of these times,) were generally merciful and gracious lords to the inhabitants of their towns. For it was entirely in their choice to let them to a provost or custos, with power sufficient to oppreſs the inhabitants; or they might let out their towns at a rack-rent, or otherwise, to any one they pleased to gratify."

The cities appear to have been, at the conquest, little better than villages.—York itself, though it

was always the second, at least the third city in England, contained then but 1418 families.—There was no spirit for buildings of conveniency, far lefs for magnifience*. For Malmesbury tells us, that the great distinction between the Anglo-saxon nobility, and the French or Norman, was, that the latter built magnificent and stately castles; whereas the former consumed their immense fortunes in riot and hospitality in mean houses.

There was in those days no middle rank of men, who, as we see now, gradually mix with their superiors, and procure insensibly honour and distinction. If by any extraordinary accident a person of mean birth acquired riches, a circumstance so singular made him an object of universal jealousy and disgust to all the nobles, and he soon found it impofsible to screen himself from oppreſsion, except by courting the protection of some great chieftain, and paying a large price for his safety.

Theft and robbery were very frequent at this time.—To impose some checks upon these crimes, it was ordered that no man ſhould sell or buy any thing above twenty-pence value, *except in open market;* and every bargain was to be executed *before witneſses.* Gangs of robbers much disturbed the peace of the country; and the law determined that a tribe of banditti consisting of between seven and

* If, as historians relate, St Paul's cathedral, which was burnt down in the year 961, was re-built the same year, nothing can be a clearer proof of the meanneſs of the chief buildings at that time, since, as Mr Maitland rightly conjectures, it must most probably have been a small timber building.

and thirty-five persons was to be called a troop; any greater company was to be denominated an army, and punished accordingly.

Notwithstanding the seeming liberty, or rather licentiousness of our remote ancestors, the great body of the people in those ages enjoyed much less true liberty, than where the execution of the laws is the most severe, and where subjects are reduced to the strictest subordination, and dependence on the civil magistrate. The reason is derived from the excess of that liberty itself. Men must guard themselves at any price against insults and injuries; and where they receive not protection from the laws, they will seek it by submission to superiors, and by herding in some inferior confederacy, which acts under the direction of a powerful chieftain; and thus all anarchy is the immediate cause of tyranny, if not over the state, at least over many of the individuals.

Whatever we may imagine concerning the usual truth and sincerity of men, who live in a rude and barbarous state, there is much more falsehood, and even perjury amongst them than in civilized nations; and virtue, which is nothing but a more cultivated reason, never flourishes to any degree, nor is founded on steady principles of honour, except where a good education becomes general; and men are taught the pernicious consequences of vice, treachery, and immorality. Even superstition, though more prevalent among ignorant nations, is but a poor supply for the defects of knowledge and education; and our European ancestors, who employed every mo-

ment the expedient of swearing on *extraordinary croſses and reliques*, were leſs honourable in all engagements than their posterity, who from experience have omitted those ineffectual securities. This general proneneſs to perjury, was much increased by the usual want of discernment in judges, who could not discuſs an intricate evidence, and were obliged to number, not weigh, the testimony of witneſses. Hence the practice of single combat was employed by most nations on the continent, as a remedy against false evidence; and though it was frequently dropped, from the opposition of the clergy, it was continually revived from the experience of the falsehood attending the testimony of witneſses.

The price of all kinds of wounds and injuries was fixed by the Saxon laws:—a wound of an inch long, under the hair, was paid with one ſhilling: one of a like size on the face, two ſhillings: thirty ſhillings for the loſs of an ear, &c. &c. &c. There seems not to have been any difference made according to the dignity of the person. Any one who committed adultery with his neighbour's wife, was obliged to pay him a fine, and *buy* him another wife. Murder itself was only liable to a fine or compensation to the kindred of the deceased; and to satisfy the church by their penance. When a person was unable to pay the fine, he was put out of the protection of the law; and the kinddred of the deceased had liberty to puniſh him as they thought proper.

As to the value of money in those times, compared to the neceſsaries of life, we find that a ſheep was

eſtimated at a ſhilling; the fleece was two fifths of the value of the whole ſheep: an ox was computed at ſix times the value of a ſheep; a cow at four: a horſe was valued at about thirty ſhillings of our money; a mare a third leſs; whereby it appears a horſe was then five or ſix times the value of an ox. A man was valued at three pounds; the board wages of a child, the firſt year, was eight ſhillings. William of Malmeſbury mentions it as a remarkably high price, that William Rufus gave fifteen marks for a horſe, or about 30l. of our preſent money. Land was ſold for little more than a ſhilling an acre; a hen coſt about three-halfpence.

It is to be remarked, that in all ancient times, coin, by reaſon of the low ſtate of huſbandry, bore always a higher price, compared to cattle, than it does in our times. The ſaxon chronicle tells us, that in the reign of Edward *the Confeſſor*, there was the moſt terrible famine ever known, inſomuch that a quarter of wheat roſe to at leaſt 15s. of our preſent money, which appears by comparison to have been a moſt enormous famine. I am, *&c.*

Edinburgh, PROMETHEUS.
March 29. 1793.

POETRY.

DELIA TO CLITO.

In answer to the epistle in our last.

If, to a *starving son of want*, a feast
Can comfort yield, and constitute him blest:
If, to a *wretch condemn'd*, a kind reprieve
Can joy bestow, and his sad soul relieve:
Not less delight, did thy dear lines impart,
My *Clito*, to my longing anxious heart!
Oh! had I been some rustic of the plain,
And, *Clito* thou, some humble village swain,
Then, would no angry father's harsh decree,
Have forc'd thee from thy country—friends and me!
Pleas'd, our fond tales of love we would have told,
As we, together, sped our flocks to fold,
Near some transparent stream, whose windings lead
In sweet meanders o'er the fragrant mead,
We would have sat, and, mutually exprest
The soft sensations of each honest breast.
Frequent, I tread the solitary gloom,
Where, oft together, we were wont to roam:
Sometimes, I hie me to the jess'mine grove,
Dear, happy spot, where *Clito* told his love!
Where, first, he all his fervent flame disclos'd,
And, every secret of his soul expos'd:
Where, bath'd in melting tears that copious flow'd,
Eternal truth, and constancy he vow'd!
Whilst, to my mem'ry, fond reflection brings
Past tender moments, and pathetic things!
But ah! those joys are fled!—those scenes are o'er,
Nor I, perchance, shall realize them more!
Ah! what are all the charms of pomp and show?
To me they're joyless, and insipid too.
The world, can boast no solid bliss for me;
I'd give its fleeting pleasures, *all for thee!*
For thee, I'd bear the cold—bleak, northern blast,
Or raging sun, that browns the eastern waste:
T' enjoy thy love, I'd scale whole hills of snow,
Tho' death and dangers threaten as I go!
Brave desert wilds, encounter rapid floods,
Explore unheard of climes, and savage woods!
Spurn, at the glories of a monarch's throne,
To make my faithful *Clito* all my own!

Reject th' exhauſtleſs riches of *Peru*,
Its boundleſs wealth, my *Clito*, all for you!
One lonely hour, when ſilence reign'd around,
And every eye was cloſ'd in ſleep profound:
When ſolemn midnight, held her ſable reign,
Morpheus, the God of dreams, poſſeſs'd my brain.
Methought I ſaw thee on a rugged coaſt,
With grief tranſported for thy *Delia*, loſt,
Adown thy cheeks the briny torrents flow,
And heard thy groans expreſſive of thy woe:
Methought, a ſavage Indian aim'd his dart
At thy defenceleſs—agoniſing heart!
Then, quick inventive fancy chang'd the ſcene,
And plac'd thee amid fields of blooming green;
Plac'd thee my *Clito*, near an woodbine grove,
With a fair female, whom thou call'dſt thy love!
There, I beheld thee all abſorb'd in bliſs,
Vow laſting faith and pledge the mutual kiſs,
Whilſt my ſad ſoul, which nothing could aſſuage,
Of *perjur'd love*, exclaim'd with frantic roge;
Till with diſtreſs I woke at morning light,
And found 'twas all a viſion of the night.
Oh, *Clito*, hard's my wretched lot to prove,
Each varied pain that abſence yields to love!
But thee, I'll ne'er diſtruſt, thou matchleſs youth,
Whoſe ſoul is goodneſs, and whoſe words are truth!
Tho' cruel fate hath fix'd thy hapleſs doom,
Far from thy love, on foreign ſhores to roam;
Tho', from my arms, my *Clito*, thou art hurl'd,
A mourning exile, to a diſtant world!
What, tho' ſoft pleaſure ſpreads her ſilken chains,
And wealth and grandeur thrive on eaſtern plains?
What, tho' ten thouſand nymphs around thee dwell,
Whoſe blooming charms, all others do excell?
Yet, to thy *Delia*, thou wilt true remain,
And wealth, and beauty tempt thy faith in vain!
Yes, dearest Clito, let us not deſpair,
But, conſtant, Heav'n invoke with earneſt pray'r.
Then, may the powers, in pity to our ſmart,
Intenerate thy angry father's heart.
Propitious Heav'n, may yet appoint a day,
When all our doubts, and cares, ſhall flee away,
When, thou ſhalt in a father's ſmiles be bleſt,
And claſpt again with ardor to his breaſt;
When, (oh, bleſt thought!) on *Britain's* happy ſhore,
We, once again ſhall meet—to PART NO MORE!

EDDA RESENII, Hafniæ, 1665. 4to.

Compared with Mallet and Goranson, their Editions.

The Editor has been favoured with the following brief analysis of the Edda,—a collection of the most ancient northern historical tracts that have been brought down to our times, by an ingenious correspondent, whose writings have thrown great light on many departments in the republic of letters. These are the earliest attempts at historical records, and afford only obscure hints of certain transactions now so totally forgotten as to put it out of our power to separate the truth from fiction. But Denmark is rich in historical records of a later date, and less doubtful authority, which the prince of that country, with a judgement and munificence that give him a distinguished pre-eminence among the princes of Europe, has been gradually publishing to the world for many years past, in such a manner as to render them accessible to all neighbouring nations, on whose ancient history these volumes will tend to throw considerable light. Among these the writings of Snorro hold a conspicuous rank, from whose history some extracts were lately given which have been furnished to the Editor by a correspondent to whom the readers of the Bee are indebted for many other valuable communications.

This book contains, *first*, A Dedication to Frederic III. of no less than fifty-eight pages, and which presents a complete catalogue of all the books published on ethics or moral philosophy, either by ancients or moderns. This dedication Mallet calls the *preface*, by an odd mistake. Resenius tells us in the end that he was professor of ethics, and so, as seems, thought himself obliged to give the king a catalogue of books on them! Never was pedantic folly carried so far!

2d, The preface of fifty-two pages, containing a tolerable account of the Eddas, elder and latter; of Snorro, *&c.*

3*d*, The Edda and Skalda, printed as one work. The former contains about 220, the latter about forty pages. Every chapter first appears in Icelandic, but printed in Daniſh characters; then a Daniſh translation, then a Latin. The Daniſh is by Stephanius, the Latin by Magnus Olai. Various readings are annotated from the manuscript and Latin translation of Stephanius. The version of Magnus has not the dialogue, nor the Icelandic here publiſhed, so that cutting off the two first chapters, the work would run in plain narration. The absurdity of Har and Jafuhar (Odin himself, as appears from the Skalda,) giving an account of Odin, infers that the dialogue is an interpolation.

The book has neither pages nor folios marked throughout.

The Edda has LXXVIII mythologies or fables; Mallet has 33, Goranson 26. But the division is arbitrary; Mallet and Goranson containing the same matter. Of the LXXVIII fables both omit from fable L to fable LXXVIII inclusive, that is twenty-eight fables.

This Edda differs widely from Goranson's in its introductory part, which consists of three chapters, I. *Quid sit Edda*; II. *De partibus Eddæ*. These two little chapters, and an epilogue at the end, are not found in ancient manuscripts; and Resenius thinks they were written by Magnus Olai, the Latin translator.

But the grand difference consists in chapter III. of this introductory part, which is very long, and is not found in Goranson's edition. It contains, 1st, An account of the creation. 2d, The flood, and how eight men and women (*homines,*) were saved. 3d, Of Zoroaster, architect of the tower of Babel, and the origin of idolatry. 4th, Of Troy or Asgard, and Odin or Priam. 5th, Of Saturn and Ju-

piter, and how Saturn fled to Italy, and was called *Niord.* 6th, Of Priam seventh from Jupiter, and of Hector, and how Odin fled from Pompey. [*N. B.* This last paſsage is the sole foundation for the fooliſh idea of Mallet, concerning Odin and Pompey.] This chapter proceeds, 7th, To tell how Odin, with many followers, went from Asia to Saxony, where he gave Westphalia to one of his sons, France to another; and thence to Reid Gotland, which the author says expreſsly is now called *Jutland*, which he gave to Skiold, whence the Daniſh kings called *Skioldungar.* 8th, Odin goes to Sweden, where Gylf reigned, who offers him and his followers what territory they pleased: Odin chooses Sigtun, and aſsumes the name of Niord. He inſtitutes twelve princes on the plan of Troy, who were to give judgement in the Turkiſh faſhion, *secundum consuetudines Turcicas!* 9th, Odin goes to Norway, and gives it to Seming, his son, from whom the kings and chiefs of Norway descend. Then the tongue of the Asæ spread all over Saxony and the North.

It is almost needleſs to remark, that this strange chapter differs altogether from Snorro's history, and from the Edda itself; so that it must have been an interpolation by some ignorant modern hand.

EDDA.

The Edda itself consists of Mythologies and Histories: They are arranged as under.

Mythologies.

Fable I. Is not in Goranson nor Mallet. It tells how Gylf gave Gefiona as much land as four oxen could plough; and who made with her plough the island of Seland. Brag, the poet is quoted. It is from Snorro's history, *c.* 5.

Fab.	According to Mallet.
II	Prologue.
III	1
IV	2
V	3
VI	4
VII	5
VIII, IX, X	6
XI, XII, XIII	7
XIV	8
XV	9
XVI *, XVII †	10
XVIII	11
XIX, XX	12
XXII	13
XXIII, XXIV	14
XXV, XXVI	15
XXVII, XXVIII	16
XXIX	17
XXX, XXXI	18
XXXII	19
XXXIII, XXXIV, XXXV	20
XXXVI	21
XXXVII †	22
XXXVIII, XXXIX	23
XL	24
XLI	25, 26
XLII	27
XLIII	28
XLIV, XLV	29
XLVI	30
XLVII	31
XLVIII	32
XLIX	33

End of Part First according to Mallet.

The following fables are not given by Mallet or Goranson, and it seems doubtful if they belong to the Edda. The Italic numerals denote the fables omitted.

1. (L) Æger, a magician, goes to see the Asæ, and is nobly entertained, the hall being illuminated with the light of swords only. Brag sits next him, and tells him tales of the Asæ.

* The giant Hrosvelgur causes north wind.

† Suasudur the south. Not in Mallet nor Goranson.

‡ Real end of the mythology.

Fab. *I.* 2. (LI) Of Odin, Lok, and Hœner. On a journey they try in vain to boil a bull which they have killed. An eagle sitting on a tree, eats it, and forces Lok to swear that he will decoy Iduna and her apples. It is Thiaſse the giant metamorphosed.

—— 3. (LII) Thiaſse carries off Iduna. Lok redeems her. Thiaſse slain by the Asæ.

—— 4. (LIII) Skada, daughter of Thiaſse, marries Niord.

Fab. *II.* 5. (LIV) Olvald, father of Thiaſse, divided his gold among his children by mouthfuls, whence gold called *The giants mouthful*, &c.

Fab. *III.* 6. (LV) The duel of Thor and Hrugner the giant, whose weapon was a whetstone, and all whetstones are parts of it. Hrugner slain.

—— 7. (LVI) Groa, a witch, tries in vain to take out a part of the whetstone which stuck in Thor's head.

Fab. *IV.* 8. (LVII) Thor's journey to Geirod's town. Geirod and his daughters slain.

End of Brag's tales.

Fab. *V.* 9. (LVIII) The Asæ go to feast with Æger. Lok kills the servant of Æger.

Fab. *VI.* 10. (LIX) Lok cuts off Sif's hair, and gets from the dwarfs golden hair. The ſhip Skydbladner, Thor's hammer, *&c.*

Fab. *VII.* 11. (LX) Origin of poetry. The gods and Vans make a man. He is slain by two dwarfs, Fialar and Galar, and his blood mixed with honey is poetry. These dwarfs also kill Gilling, a giant, and his wife.

—— 12. (LXI) Suttung, son of Gilling, imprisons the dwarfs, and gives the poetic draught to his daughter Gunlauda, to keep.

—— 13. (LXII) The Asæ acquire poesy. Odin hires himself as a servant to Baug, brother of Suttung. He can-

ses Baug bore a hole through a stone in the wall of Gunlauda's chamber, turns himself into a worm, lies with her three nights. She lets him drink all the potion. He turns himself into an eagle, &c. as in Mallet.

Historical.

Hist. *I.* 1. (LXIII) Of Hrolf Krak, king of Denmark. Origin of the proverb, *Parvo Voggus gaudet.*

—— 2. (LXIV) Adventures of the same, and Adis king of Upsal. Why gold called *The seed of Fyrefield*, &c.

Hist. *II.* 3. (LXV) Holg, king of Halogaland, buried in a tomb roofed with gold and silver. Hence gold called *The roof of Holg's tomb.*

Hist. *III.* 4. (LXVI) Frode Fridleif, and the mill of Fenja and Menja. Salt called *The meal of Fenja*, &c.

Hist. *IV.* 5. (LXVII) Of Hilda, daughter of king Hogna. Why battle called *Hildur*, &c.

Mythological (out of place.)*

Fab. *VIII.* 14. (LXVIII) Odin, Lok, and Hœner kill an otter.

—— 15. (LXIX) Hreidmar calls his sons *Fafner* and *Regin*, and tells that the Asæ had killed Ottar, their brother, who used to hunt, changed into an otter. The Asæ promise as much gold as will cover the otter's skin.

—— 16. (LXX) Lok goes to Andvar, the dwarf, to get gold. The gods cover the skin. Hence gold called *The otter's price.*

Historical.

Hist. *V.* 6. (LXXI) Fafner and Regin kill their father for his gold. Fafner takes all; turns himself into a serpent, and guards it.

* But it may be said that all to the end forms the history of Sigurd, Gudruna, and their children.

—— 7. (LXXII) Regin becomes smith to king Hialfrek, who educated Sigurd [Torf. Ser. 333.] son of Sigmund Volsung, and of Hiardisa, afterwards a great king. Regin makes a sword wherewith Sigurd kills Fafner. He broils his heart, and learns the speech of birds. Warned by two swallows, he kills Regin. Gold called *The bed of Fafner.*

Hist. *VI.* 8. (LXXIII) Sigurd marries Gudruna, daughter of Giuki, and has two children, Sigmund and Suanhilda.

—— 9. (LXXIV) Of Brinhilda and the death of Sigurd.

Hist. *VII.* 10. (LXXV) King Atle kills the Giukungi, sons of Sigurd. Gold called *The strife of the Niflungi or Giukungi.*

Hist. *VIII.* 11. (LXXVI) Gudruna kills Atle, and marries king Jonaker, by whom she has three sons, Saurl, Hamder, and Erp. Suanhilda, daughter of Sigurd, educated.

—— 12. (LXXVII.) King Jormunrek marries Suanhilda. Randver, his son, wishing to have her, is put to death.

—— 13. (LXXVIII) Jormunrek kills Suanhilda. Gudruna excites her sons Saurl, Hamder, and Erp, to slay Jormunrek, but they are seized and stoned to death. Hence stones are called *The bane of the brothers.*

End of the Edda.

An epilogue is added by Olai of no moment.

J. C.

Observations on the Above.

It is a very singular fact that the original histories of all nations are marvellous fables and tales, which are utterly incomprehensible by the human understanding. The

fables and extravagant stories hinted at in the foregoing abridgement of the Edda, bear such a similarity to the mythological fables of the Hindus, and other Asiatic nations, many of which have been lately brought to light by the researches of the Europeans in Asia; and these are so like to the fables of the Egyptians, Phœnicians, and Greeks, as to give a strong indication that they must all have had one common origin. To discover the origin of this universal coincidence in such a seemingly unnatural aberration of the human mind, would afford matter for a very curious investigation. By the foregoing very brief analysis of the Edda, when compared with other early tales of nations, the fact is incontestibly proved; and it appears to be one of the most singular facts respecting man that has yet been brought to light.

Let us not, however, plume ourselves with the notion that the natural faculties of man, at a distant period, were weaker than those we now enjoy, although many of the writings that have been preserved to us appear absurd. We all know that certain moral causes have a power of influencing the mind to an astoniſhing degree, and of over-ruling its natural powers at certain times, so as to induce peculiar modes of thinking and of reasoning, even among the wiſest men, that at another period appear to have been the most childiſh and absurd imaginable. Perhaps few of the human race was ever endowed with natural faculties of superior energy to those of *Duns Scotus*; yet his finest reasoning we now deem but quibbles: and what can appear to be more absurd than the reveries of Swedenburgh, who was allowed to be a man of talents far exceeding those of the common race of men. These are proofs that the human mind is at the present day equally liable to err as in former times; and the Proverbs of Solomon afford a clear incontestible evidence that

the understanding of man was in former times equally vigorous as at present.

Let us not, then, despise those who have written what we cannot understand; or think, that because their fables appear to us extravagantly absurd, that the persons who believed in these things were by nature inferior to ourselves. Let us rather, when we feel in ourselves a disposition to assume a dictatorial authority above others, be convinced, that we also, may in our turn, be found to have been under the influence of some fascinating power that has led our understandings astray; and let us at all times with becoming humility of mind, instead of arrogantly assuming to ourselves a superiority above all others, rather lay our hands on our mouths, and our mouths in the dust, humbly beseeching the Supreme Being to banish from our hearts all vanity and pride, that we may be thus enabled to act our part in this life with kindness to others, and mutual forbearance; as knowing that a time will soon arrive, when all these boasted attainments, on which we are apt to plume ourselves so much, shall appear at best to be but weak and foolish reveries like the fables of ancient times.

The deformed and handsome Leg.

By Dr Franklin.

There are two sorts of people in the world, who, with equal degrees of health and wealth, and the other comforts of life, become, the one happy, and the other miserable. This arises very much from the different views in which they consider things, persons and events—and the effect of those different views upon their own minds.

In whatever situation men can be placed, they may find conveniencies and inconveniencies: in whatever com-

pany, they may find persons and conversations more or leſs pleasing: at whatsoever table, they may meet with meats and drinks of better and worse taste, diſhes better and worse dreſsed. In whatever climate, they will find good and bad weather: under whatever government, they may find good and bad laws, and good and bad administration of those laws. In every poem, (or work of genius) they may see faults and beauties. In almost every face, and every person, they may discover fine features and defects, good and bad qualities.

Under these circumstances, the two sorts of people above mentioned fix their attention, those who are disposed to be happy, on the conveniencies of things, the pleasant parts of conversation, the well dreſsed diſhes, the goodneſs of the wines, the fine weather, *&c. &c.* and enjoy all with chearfulneſs. Those who are to be unhappy, think and speak only of the contraries. Hence they are continually discontented themselves; and, by their remarks, sour the pleasures of society, offend personally many people, and make themselves every where disagreeable. If this turn of mind was founded in nature, such unhappy persons would be the more to be pitied. But as the disposition to criticise and be disgusted, is, perhaps, taken up originally by imitation, and is unawares grown into a habit, which, though at present strong, may nevertheleſs be cured, when those who have it, are convinced of its bad effects on their felicity, I hope this little admonition may be of service to them—and put them on changing a habit, which, though in the exercise it is chiefly an act of imagination, yet has serious consequences in life, as it brings on real griefs and misfortunes. For, as many are offended by, and nobody loves, this sort of people, no one ſhows them more than the most common civility and respect, and scarcely that; and this frequently puts them out of humour, and draws them into disputes and

contentions. If they aim at obtaining some advantage in rank or fortune, nobody wiſhes them ſucceſs, or will ſtir a ſtep or ſpeak a word to favour their pretensions. If they incur public cenſure or diſgrace, no one will defend or excuſe, and many join to aggravate their misconduct, and render them completely odious. If these people will not change this bad habit, and condescend to be pleased with what is pleasing, without fretting themſelves and others about the contraries, it is good for others to avoid an acquaintance with them, which is always disagreeable, and sometimes very inconvenient, especially when one finds himself entangled in their quarrels.

An old philoſophical friend of mine was grown, from experience, very cautious in this particular, and carefully avoided any intimacy with such people. He had, like other philoſophers, a thermometer to ſhow him the heat of the weather, and a barometer, to mark when it was likely to prove good or bad; but there being no inſtrument invented to diſcover, at first ſight, this unpleaſing diſpoſition, in a person, he for that purpoſe made use of his legs, one of which was remarkably handsome, the other, by some accident, crooked and deformed. If a ſtranger, at the first interview, regarded his ugly leg more than his handsome one, he doubted him. If he ſpoke of it, and took no notice of the handsome leg, that was ſufficient to determine my philoſopher to have no further acquaintance with him. Every body has not this two legged inſtrument—but every one, with a little attention, may observe ſigns of that carping, fault-finding diſpoſition, and take the same reſolution of avoiding the acquaintance of those infected with it. I therefore advise those critical, querulous, discontented, unhappy people, that if they wiſh to be respected and beloved by others, and happy in themselves, they ſhould *leave off looking at the ugly leg.*

THE BEE,

OR

LITERARY WEEKLY INTELLIGENCER,

FOR

WEDNESDAY, AUGUST 7. 1793.

ON THE DIFFERENT VARIETIES OF SHEEP IN A WILD AND DOMESTIC STATE, REARED IN THE RUSSIAN EMPIRE, AND BY THE PASTORAL NATIONS FROM THE FRONTIERS OF EUROPE TO THOSE OF CHINA.

Continued from p. 133.

The second variety.

Dr Guthrie

Short tailed sheep.

THIS variety of domestic sheep is called the *Russian*, and Pallas has named it *ovis brachiura*, or short tailed. It is reared through out all the north of Russia, and resembles that of Iceland, in size, tail, and coarseness of fleece.

Thus we see that although the northern regions of Russia are little favourable to *wool bearing* animals, yet they boast of a variety of the short tailed sheep, peculiar to the country, which although resembling the Icelandic in many respects, yet differs from it in a very essential character, that of the *horns*, which are much smaller, and have nothing

of that exuberance which Buffon and others attribute to the ſheep of that island.

It resembles the Tscherkeſsian ſheep described in last article, in the form of its *head*, straight upright *ears*, and in thickneſs of *fleece*; but the quality of the two fleeces are widely different; as this variety has *wool* almost as coarse as dog's hair: but the great distinguiſhing character between them is the *tail*, which is almost a quarter yard ſhorter than that of the Tscherkeſsian.

The *brachiura* or ſhort tailed ſheep, is reared not only by the northern Ruſsians, but likewise by the Fins and other neighbouring nations. Some of this variety have been transported by the Ruſsians into Siberia, where they have supported themselves on some pastures, though in poor condition; but through all the southern countries, they are in leſs estimation than the long tailed, and fat tailed, varieties, which are much superior to them for size, fat, and good eating. The ewe of this ſhort tailed variety, couples readily with the ram of the *steatopyga* or fat tailed breed, and produces an animal nobler and larger than its mother, with a *tail* swelled at the base with fat, but meagre towards the end, like that of the mixed breed, which makes Dr Pallas's fourth and last variety of domestic ſheep.

The ewe of the *brachiura* (always the subject of this article,) couples likewise clandestinely with the domestic he goat, and produces an animal much

reſembling the mother, but with a fleece of *wool and hair* *.

The *brachiura* or Ruſsian ſheep, ſupports very well the ſeverity of a northern climate, and Dr Pallas doubts not but it might paſs the *winter* in the plains of mountainous northern countries, where there is not much ſnow; nay he even thinks it might augment their hardyneſs and ſtrength, if we are to judge from their habits and treatment of the Iceland flocks, ſo well deſcribed by Anderſon in his account of that iſland.

Dr Pallas remarked that on mountainous paſtures, expoſed to the ſun, ſuch as on the acclivity of the Ouralic chain, the Ruſsian or ſhort tailed ſheep, were larger, fatter, and had a finer *fleece*.

Croſsing the breed with the Tſcherkeſsian or long tailed ſheep, likewiſe mends both the ſtature and fleece of the *brachiura;* whereas in its own natural ſtate, without admixture of other varieties of ſheep, it is but ſmall, lean, and produces, in the northern parts of Ruſsia, a wool ſo extremely coarſe, as on-

* Has this fact been ſufficiently aſcertained? I very much doubt it. In many parts of Scotland the ſheep and goats go together promiſcuously at all ſeaſons; and notwithſtanding what has been ſaid by Buffon, and other naturaliſts on that ſubject, it is a certain fact that no perſon in theſe countries, ever ſaw a breed produced between the goat and the ſheep. This opinion ſeems to have been adopted merely from the ſhaggy appearance of the fleece of ſome breeds of ſheep, which much reſembles the hair of a goat; but theſe are found equally in countries where no goats exiſt, as in thoſe where goats aboound.
Edit.

ly to be fit for the cloth of peasants, in a state of vaſsalage *.

The third variety.

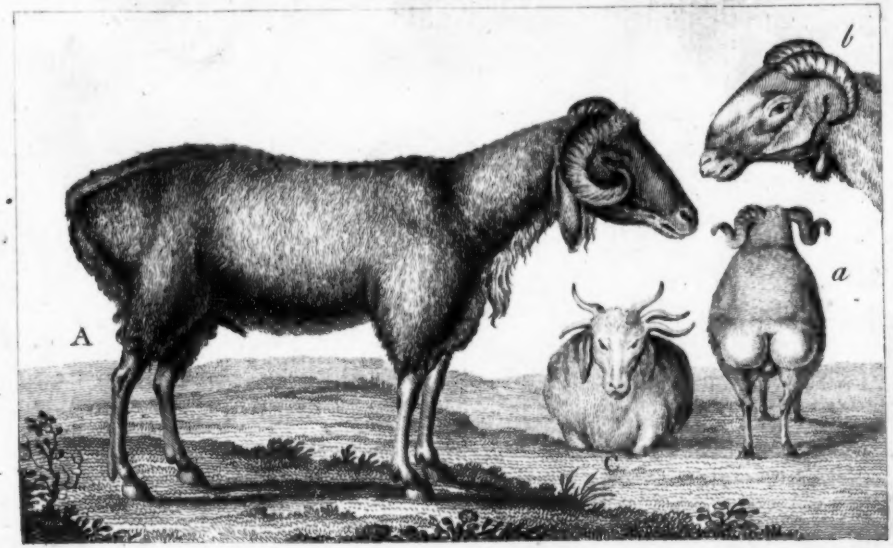
The STEATOPYGA, *or fat rump of Pallas; the* OVIS LATICAUDATA *of authors.*

This variety, which has no fixed trivial name, but is differently denominated in every country where it is reared, is both the most abundant and largest breed of ſheep in the world.

It is reared throughout all the temperate regions of Asia, from the frontiers of Europe to those of China, in the vast plains of Tartary. All the Nomade hordes of Asia, the Turcomans, Kirguise, Calmouks, and Mongal Tartars, rear it; and indeed

* The coarseneſs of the fleece seems to be by no means a characteristical peculiarity of this breed of ſheep. The Shetland breed of ſheep is obviously referable to this claſs, and it produces the finest wool of any that is yet known. I myself have seen an indefinite number of varieties of this breed of ſheep, each of them poſseſsing certain hereditary and distinguiſhable peculiarities. Some of these carried wool of the finest pile I have ever seen, and softest quality; while others carried wool extremely coarse, and of very little value. It would seem that this last breed of this variety of ſheep had chanced to be very generally diſseminated over the Ruſsian empire. Smallneſs of size seems to be a very general distinguiſhing peculiarity of this breed of ſheep. The having or wanting horns is by no means characteristic of this breed. Neither is the tendency to leanneſs a permanent peculiarity. The fattest ſheep I ever killed was of this breed: it was of a very small size,—had run abroad all winter among a considerable flock, which was not fed for the butcher. It was killed in the month of May. The hind quarter weighed only five pounds and a half, sixteen ounces to the pound, and it gave six pounds of tallow, twenty-six ounces to the pound—from which some idea may be had of the nature of the mutton. It was a ewe that had miſsed lamb.

Edit.



Russian Sheep, PLATE II.nd THE STEATOPYGA.

it conſtitutes their chief riches, the number they poſſeſs being enormous. The Perſians also rear it in abundance; as likewiſe the Hottentots, as we are informed by Kolbe in his travels to the Cape of Good Hope; whilſt Osbeck in his journey to China, aſſerts that the *fat tailed* ſheep are reared through that whole empire.

We know from other authorities, *viz.* Shaw, and the abbé Demanent, two writers quoted in a former article, that the ſame breed obtains in Syria, Mauritania, and the other regions of Africa, under ſome modifications of *form*, from different cauſes, ſo that the doctor thinks he has brought ſufficient evidence of what he advanced in the beginning of this article, *viz* that the ſteatopyga or fat rumped ſheep is the moſt univerſally reared and multiplied of any breed in the world.

Here however the pure *unmixed* race is only treated of, as they exiſt in the vaſt deſerts of Great Tartary, influenced in their form only by paſturage, ſoil, air, and water; no other variety being near to contaminate their blood.

The flocks therefore of all the Tartar hordes reſemble one another by a large yelloviſh muzzle, the upper *jaw* often projecting beyond the lower; by long hanging *ears;* by the horns of the adult ram being large, ſpiral, wrinkled, angular, and bent in a lunar form.

The body of the ram, and ſometimes of the ewe, ſwells gradually with fat, towards the poſteriors; where a ſolid maſs of fat is formed on the rump, and falls over the anus in place of a tail, divided into

two hemiſpheres, which take the form of the hips, with a little button of a tail in the middle, to be felt with the finger *.

This variety, beſides the characters mentioned above, have ſlender legs in proportion to their bodies, a high cheſt, large hanging teſticles, a large prepuce, and tolerably fine *wool* mixed with *hair*.

Such are the great characteriſtic marks by which the flocks of all the Tartar hordes reſemble one another; but climate, ſoil, *&c.* produce ſome ſmall difference on this variety, whether reared by the Tartars, or the Ruſsians, in the weſtern deſerts of Great Tartary, from the river Volga to the Irtiſh, and the Altaic chain of mountains. In all that tract of country, the paſturage is moſtly arid, and it abounds in acrid and liliaceous plants, in ſpring, whilſt in ſummer it produces, at leaſt in the open ſpots where ſheep delight to feed, beſides gramen, bitter and aromatic plants artemiſia, camphoroſna, and many ſpecies of ſalſola, abounding in juices and ſalts.

There is likewiſe found every where an efflorescence of natron, with ſea, or glauber's ſalt; nay even the waters of the deſert contain in general the ſame ſalts.

Now it is almoſt unneceſsary to inform European ſhepherds, that ſuch paſturage has the effect of augmenting the *ſize of ſheep*, if it produces no other change upon them, ſo that we ſee in this inſtance, how ſome kind of difference may ariſe amongſt ſheep of the ſame breed, merely from accidental cau-

* See plate ſecond, letter A. This plate will be given with a future number. *Edit.*

ses, without the least admixture of hetrogeneous blood.

Kirguise Tartar flocks wandering in Great Tartary.

The mode of life of the southern Tartar flocks, may certainly have an influence upon them, as well as on the western just mentioned. It is as follows:

They enjoy a moderate winter with regard to cold, from the protection of mountains, although they pafs it in the open air, with their Nomade masters; living mostly on dry stalks, especially those of the half dry worm-wood, which is abundant in the more elevated situations, that the wind keeps clear of snow.

In the spring, their masters conduct them to pastures rich in rising plants and flowers *; and now being come into a most palatable and favourite pasturage, sprinkled with the above mentioned salt efflorescence scattered by the wind, and further impregnated with saline dews, which fall often there in the night, they augment their bulk very considerably during summer, and still add to it in autumn, by the pasturage mentioned above, abounding in salsola and artemisia.

In these long journies, they are often deprived of water for a considerable time, till they come to

* Virgils excellen description of the Lybian Nomade fhepherd in his 3d book of the Georgics v. 340, answers well o the Tartar Nomades

Diem noctemque et totum ex ordine mensem
Pofsitur—itque pecus longa in deserta sine ullis
Hospitiis; tantum campe jacet omnia secum
Armentorius afer agit, tectumque laremque
Armaque Amyclaremque canem Creſsamque pharetram, &c.

some brackiſh well, of which they drink most greedily. In ſhort the flocks partake both the pleasures and sufferings of their wandering masters, and enjoy almost as much liberty.

However in one respect, they enjoy but a limited portion, that is in illicit and promiscuous amours, to prevent which the Tartars tie about the belly of the rams, some old rags, after* they have covered the ewes at a stated time, so that they may bring forth their young, when every natural advantage awaits them. Forty or fifty rams are sufficient for a thousand ewes, and still they are so prolific, that they generally bring two, and often three lambs, at a time; especially when the bandage of chastity has been employed.

Thus the ſheep are fattened from their infancy, and their size augmented: first by great abundance of mother's milk, and then by saline bitter pastures, insomuch that they often weigh in those regions 200 pounds; of which weight, the soft oily fat alone that forms on the rump, independent of suet, amounts to from twenty to forty pounds. The *uropygium* or fat rump, which is made up of this oily species of fat, is so very large as to incommode the animal in walking; but when the same ſheep are carried into the interior parts of Ruſsia, the tail loses half its size and weight, nay sometimes more, from a change in their food and mode of life.

Johnston in his work on quadrupeds, confirms the fattening and prolific effects of saline pastures by say

* Query, Ought not this to be *before*. *Edit.*

ing, " that ſheep become fatter in the maritime ſalt marſhes of Italy, than on any other kind of pasture."

Some of the hordes of Kirguiſe on the river Irtiſh, and the Stauropol Calmouks, who wander on the banks of the Volga below Samara, in the government of Casan, rear a breed of the same ſheep, but much diminiſhed in size, in the mountainous country they inhabit, by the want of saline pastures, and by the depth of snow which falls there, that naturally produces a scarcity of winter food, amongst careleſs wandering hordes who do not provide hay.

In those flocks, both sexes are often without horns*.

The same variety, *viz.* the steatopyga or fat rumped ſheep are still smaller with the pastoral Tartars on the Jenisey; and have still leſs fat on the tail, than the flocks alluded to above. Those of the Bouretes come likewise under the last description of diminiſhed ſheep, from the coldneſs of their mountainous regions, where the plants are crude, without saline impregnation; at the same time that the country is devoid of saline efflorescence, and where even water is very scarce. All these wants joined to cold, render the country of the Bouretes very unfit for rearing large sized fat mutton. The Mongal Tartars who dwell near Selenga have ſheep rather larger than those of the three hordes just mentioned; but never of the size of the Kirguise flocks, treated of in page 159. Whereas the transalpine Dauric re-

* See plate third letter A.

gions although likewise cold, but exposed to the south, and the genial influence of the sun, produce the largest domestic rams Dr Pallas saw in his whole travels, larger than those of the Kirguise, and noteven yielding in sizeto the European musimon; yet the maſs of fat on the rump or tail is very small, not exceeding much the size of two fists, and seldom weighing ten pounds.

The reason of this remarkable change in the size of the fat tail or uropygium, seems to be, that there is very little wormwood in that district; and although there are some salt lakes, which produce an efflorescence, yet the pasture is little or nothing impregnated with it, which has so great a ſhare, in Dr Pallas's opinion, in producing that particular species of fat which forms on the *tail*. The plants that obtain there are chiefly leguminous Alpine plants, amongst which the most nutritious are the *astragali*, and a small ſhrub much resembling the *robinia caragana*, which ſheep devour with much avidity, and which has a considerable ſhare in increasing their size. It is likewise neceſsary to add, that very little snow lies on these mountains, and of course the flocks have open pasture all winter; so that it is not so surprising if ſheep which have the same nourishment, and pretty much the same range and habits as the musimon or wild variety, ſhould approach them in size, whilst the absence of that load of fat on the tail, so remarkable in the Kirguise flocks in the southern deserts of Great Tartary, is evidently accounted for, according to the doctor's hypothesis,

by the abſence of its cauſe, *viz. bitter ſaline paſtures*, which do not obtain in that country.

But it ſeems, that ſuch paſture alone when unaſſisted by other circumſtances, cannot ſupport the extraordinary ſize of the uropygium; for when the ſouthern Kirguiſe ſheep are tranſported, and breed in the Ruſsian colonies, even in the ſouth of Siberia, where the paſture is pretty much the ſame as in their own country, they become weak and lean, whilſt the uropygium dwindles away to the ſize repreſented in table 3d letter A.

This Dr Pallas attributes to the great change in their mode of life and treatment by the Ruſsians, who firſt of all keep them warm within doors all winter, next they give them water to drink, inſtead of letting them eat ſnow as at home; and laſtly, they deprive them of ſalt: now the effects of this change of regimen is ſtill more viſible in the deſcendents of the Kirguiſe ſheep reared in the Ruſsian villages, where the uropygium is diminiſhed to the ſize of a man's fiſt, although the little button or tail remains ſtill of its old dimenſions, and never increaſes them, if the breed is not croſsed with ſome of the other varietes, which alone merit the name of *tailed* ſheep; as that of the ſteatopyga or fat rump, ſcarcely deſerves the appellation.

To be continued.

FRAGMENTS BY LORD BACON.

Art of life, in habits of attention and observation.

For the Bee.

Continued from p. 98.

* * * * WHEN reason, industry, and experience, build upon nature, we may expect Pyramids; but where the foundation is artificial, nothing that is great or durable.

Nature is often hidden, sometimes overcome, seldom extinguished.

Force makes nature more violent in the rebound from constraint; long custom only doth alter and subdue it to the reasonable and social purposes of life, which is mainly visible in getting, keeping, and quickening the habitudes of observation and attention, which rise more sure and orderly from the nature of man and from time, than from pedantick institution.

Touching our early years, we do not rightly appretiate the wisdom of God in giving unto children the insatiable love of variety, and of handling and examining every thing that is subjected unto their view.

It is then that the human microcosm is rising out of chaos, and that the spirit of curiosity sits brooding upon the face of the deep, to bring forth the infinite variety of the human nature; and this grand operation, though it may be somewhat directed by

education, or the drawing forth of the human powers, ought not to be in any wise obstructed or precoceously directed to artificial considerations.

This exercise of natural curiosity produceth in children what may be called foreign travel, and knowledge of the world, on which the whole of the future excellence of the man is to be formed and established; and during this exercise, *if it is not preposterously and foolishly disturbed by parents, guardians, or pedagogues,* the habitudes of attention and observation are acquired and confirmed.

This is the first grand principle of a *novum arganum educationis,* which after ages, loosed from the trammels of prejudice, will evince and establish.

It hath been a complaint universal among all who charge themselves with education, *that the difficulty of obtaining and fixing the continued attention of children to learning, baffleth all their endeavours, and that while the book is in their hand, their thoughts are engaged in plays that are past, or plays that are looked for, when the irksome task of the hour or of the day is accomplished.*

Now the question herein plainly occureth which may be quickly answered:

Whether is the creator of the child, the great God of the universe, or the silly parent and pedagogue, the proper judge of what inclination the child ought to have in common with all other children for the fitting of the whole future man for fulfilling the intention of his creation.

Certainly what we foolishly call a disposition in the child to trifle, and disregard our discourses and

instructions is no other than the far superior, more interesting, more useful, important, and delectable instruction which the child is hourly, daily, and perpetually receiving from the book of nature, and from the author of nature, in the visible, audible, and tangible, objects of creation, which by infinite mutiplications, combinations, divisions, and re-unions of impreſsed notions, are verifying by experience the right knowledge of external objects, and forming that complex rational being, which, when duly improved in after times, is to be truly entitled to the appellation of man.

Now what sort of attention would you expect from Galileo Galilei, or from Keplerus, to an impertinent schoolman who ſhould pester them with pneumatological discuſsions, whilst they were examining and exploring the stars of the Medicis, or the laws of the heavenly orbits?

Do you think they would sit contentedly to listen to the jargon of the schools, while every moment was offering or presenting to their wondering perception some new appearance of delectable novelty?

Can we then marvel at the inattention of children, occupied as they are by the irrisistible power of young desire, and charmed as they are, with the enjoyment of new and delightful acquaintance with surrounding nature, for which the author of that nature has endowed them with the inexterminable instinct of curiosity! the Palladium of human reason, and that which in its greatneſs setteth man so peculiarly at the head of animated nature.

We ſhall generally find that what is called genius, or an uncommon reach of novelty in thought and invention among men, is no other than the fruit of the unſhackled powers of the understanding, working by attention, observation, and comparison, the habitude of which, hath been obtained by following that which peculiarly tickleth and delighteth the imagination or the understanding.

It is this which leadeth some men into enterprises, that are never so much as thought of by such as be guided in the trammels of pedantic institution, and from whence we see that most of our notable discoveries have been due unto men that have sprung from the earth, like the teeth of Cadmus, and have not been reared in the hot beds of pedantic seminaries.

Unto a common and careleſs observer, a rich meadow seemeth to consist of nought but graſs, daisies, butter-flowers, and some well-known weeds that do infest the pastures; but unto him who hath once been drawn to examine the diversity of plants which grow therein, a ſhort time will exhibit to his delighted and wondering eye, a variety increasing with the curiosity and intensity of observation.

Now to foſter this disposition, is a grand object both in the art of education and in the art of life, both with respect to the natural and the moral world.

The habitude of attention and observation, when it hath for its scope, the almost infinite variety of humane character and conduct, will render more and more perfect, that notable wisdom which enableth a man to discern the real dispositions of his

fellows, their secret intentions, their weak and their strong sides, their qualities and prejudices, and to know how to apply himself to please others, and yet to avoid the dangers arising from ſelfiſhneſs and treachery, a wisdom truly that is nowise crooked, and may be honestly conjoined unto moral virtue.

The eye and the ear, when duly accustomed to observe all the movements of the countenance, and the gesticulations of the body, together with the various modulation of the voice and accent, will be able to discern the slightest approaches to envy, malevolence, circumvention, and treachery; and if the guard of the eye lids are judiciously used as a parapit behind which to observe the movements of the enemy, and to ward off his miſsile weapons, much evil may be eschewed, and much advantage gained by the knowledge of the distant intentions of those with whom we are engaged in the common intercourse of life, and still more in the commerce of difficult and dangerous affairs.

In the exercise of this art, it highly comporteth to mark also the unaffected expreſsions of benevolence, in those with whom we converse, and from such, gradually to choose our principal meſsmates and companions. From these again, after due probation, to select such as may deserve some ſhare of our esteem and confidence; and last of all, out of this small groupe, to obtain that most rare and admirable gift of heaven, a real and true friend, or in other words a second self. I say a second self, for certain it is, that true friendſhip is that which not on-

ly hath not a plural, but not even a dual in its true construction and authentic prosody.

That phisiognomonical science hath been set down as of doubtful interpretation, or even existence, by deep thinkers, and prudent observers of human nature, may be owing unto this circumstance, that most men who have dealt in it, have drawn their rules more from anatomical and picturesque considerations, than from long and actual observation and experience; and have not considered that it is only deserving of credit, when taken along with the tone of the voice, the convulsionary movements, or gesticulations of the body, the air of the whole person, and a thousand concomitant circumstances, that can only be the fruit of the confirmed habitudes of attention and observation, which therefore in the art of life, are to be justly held as of high commendation and importance * *.

The rest of this section is wanting, or could not be made out from the M S.

INSTANCE OF BODILY STRENGTH.

The prodigious strength of *Bufsiqua*, made *Milon* cry out, "Jupiter have you then made another Hercules." This Bufsiqua lifted a stone which Milon could scarcely move: he carried it to a considerable distance, and threw it from him with the greatest ease. This same Bufsiqua laid hold of a bull with one hand, in the middle of his course, and held him fast, in spite of his greatest efforts to disingage himself; nay, he even seized another bull who was paſsing by accident at that time, and held them both at the same time.

ON MAKING ICE IN INDIA.

SIR, *Edinburgh*, 1793.

THE following proceſs of making ice in the East Indies, was communicated by Sir Robert Barker F. R. S. in a letter to Dr Brocklesby, which was publiſhed in the Philosophical Transactions. If it meets with your approbation, your inserting it in your Miscellany will oblige, Sir, your humble servant AMICUS.

The proceſs of making ice in the East Indies having become a subject of speculation, I beg permiſsion to present you with the method by which it was performed at Allabahad, Mootegil, and Calcutta, in the East Indies; lying between 25° 30, and 23° 30, of north latitude. At the latter place, I have never heard of any person having discovered natural ice in the pools or cisterns, or in any waters collected on the roads; nor has the thermometer been remarked to descend to the freezing point; and at the former, very few only have discovered ice, and that but seldom: but, in the proceſs of making ice at these places, it was usual to collect a quantity every morning, before sun rise, (except in some particular kinds of weather, which I ſhall specify in the sequel,) for near three months in the year viz. from December till February.

The ice maker belonging to me at Allabahad, (at which place I principally attended to this inquiry,) made a sufficient quantity in the winter for the supply of the table during the summer season. The methods he pursued were as follow: on a large open plain, three or four excavations were made, each about thirty feet square, and two deep, the bottoms of which were strewed about eight inches or a foot thick with sugar canes, or the stems of the large Indian corn dried. Upon this bed were placed in rows, near to each other, a number of small ſhallow earthen pans, for containing the water intended to be frozen. These are unglazed, scarce a quarter of an inch thick, about an inch and a quarter in depth, and made of an earth so porous, that it was visible from the exterior part of the pans, that water had penetrated the whole substance. Towards the duſk of the evening, they were filled with ſoft water, which had been boiled, and then left in the afore-related situation. The ice makers attended the pits usually before the sun was above the horizon, and collected in baſkets what was frozen by pouring the whole contents of the pans into them, and thereby retaining the ice, which was daily conveyed to the grand receptacle, or place of preservation, prepared generally in some high dry situation, by sinking a pit fourteen or fifteen feet deep, lined first with straw, and then with a coarse kind of blanketing, where it is beat down with rammers, till its own accumulated cold again freezes, and forms one solid maſs. The mouth of the pit is well secured from the exterior air with straw and blankets, in the manner

of the lining, and a thatched roof is thrown over the whole. It is here neceſsary to remark, that the quantity of ice depends materially on the weather; and consequently it has sometimes happened, that no congelation took place: at others, perhaps, half the quantity will be frozen; and I have often seen the whole contents formed into a perfect cake of ice. The lighter the atmosphere, and the more clear and serene the weather, the more favourable for congelation; as a frequent change of winds, and clouds are certain preventatives. For I have frequently remarked, that after a very ſharp cold night, to the feel of the human body, scarce any ice has been formed; when, at other times, the night has been calm and serene, and sensibly warmer, the contents of the pans will be frozen through. The strongest proof of the influence of the weather appears by the water in one pit being more congealed than the same preparation for freezing will be in other situations, a mile or more distant.

To reason physically upon this proceſs of making ice, it may be said, that, had the thermometer been suspended in the air, free from every other body capable of communicating heat, in some parts of the night during the cold months of December, January, February, the quicksilver might have descended to the freezing point, and that water, being artfully placed in a similar situation, contained in thin porous pans, and supported by a substance little capable of communicating heat from the earth, might also freeze, and continue in a state of congelation till the heat of the morning came on. I say this may be

poſsible; but at the same time, I must beg leave to observe, that, during my residence in that quarter of the globe, I never saw any natural ice. I cannot declare, that the thermometer has not descended to the freezing point during the night, because I never made the neceſsary observations; but the water in every other situation, excepting in the pans, has not appeared to be in a freezing state. The climate may probably contribute in some measure to facilitate the congelation of water, when placed in a situation free from the heat of the earth, since those nights in which the greatest quantity of ice has been produced, were, I before observed, perfectly serene, the atmosphere ſharp and thin, with very little dew after midnight. Many gentlemen now in England, have made the same remarks, in their frequent visits with me to the ice pits. The spungy nature of the sugar canes, or the stems of the Indian corn, appears well calculated to give a paſsage under the pans to the cold air; which, acting on the exterior parts of the veſsels, may carry off by evaporation a proportion of the heat. The porous substance of the veſsels seems equally well qualified for the admiſsion of the cold air internally; and their situation, being full a foot beneath the plane of the ground, prevents the surface of the water from being ruffled by any small current of air, and thereby preserves the congealed particles from disunion. Boiling the water is esteemed a neceſsary preparative to this method of congelation; but how far this may be consonant with philosophical reasoning, I will not presume to determine.

From these circumstances it appears, that water, by being placed in a situation free from receiving heat from other bodies, and exposed in large surfaces to the air, may be brought to freeze, when the temperature of the atmosphere is some degrees above the freezing point, on the scale of Fahrenheit's thermometer; and, by being collected and amaſsed into a large body, is thus preserved, and rendered fit for freezing other fluids, during the severe heats of the summer season. In effecting which there is also an establiſhed mode of proceeding; the ſherbets, creams, or whatever other fluids are intended to be frozen, are confined in thin silver cups of a conical form, containing about a pint, with their covers well luted on with paste, and placed in a large veſsel filled with ice, salt petre, and common salt, of the two last, an equal quantity, and a little water to diſsolve the ice, and combine the whole. This composition presently freezes the contents of the cups to the same consistency of our ice creams, *&c.* in Europe; but plain water will become so hard, as to require a mallet and knife to break it. Upon applying the bulb of a thermometer to one of these pieces of ice thus frozen, the quicksilver has been known to sink two or three degrees below the freezing point. So that from an atmosphere apparently not cold enough to produce natural ice, ice ſhall be formed, collected, and a cold accumulated, that ſhall cause the quicksilver to fall even below the freezing point. The promising advantages of such a discovery could alone induce the Aſsiatic, (whose principal study is the luxuries of life, and this may well be called such, when I have often re-

galed with ices when the thermometer has stood at 112°,) to make an attempt of profiting by so very ſhort a duration of cold during the nights, in these months, and by a well timed and critical contrivance of securing this momentary degree of cold, they have procured to themselves a comfortable refreſhment as a recompence, to alleviate, in some degree, the intense heats of the summer season, which, in some parts of India, would be scarce supportable, but by the aſsistance of this and many other inventions. I am, Sir, with regard, your most obedient humble servant,

R. B.

ON THE LIFE OF A FLEA.

SIR, *To the Editor of the Bee.*

BY inserting the following instance of the duration of the life of a flea, in your excellent Miscellany, you will much oblige, Sir, your humble servant, and admirer

Caithneſs
July 1793. } LYCURGUS.

On the duration of the life of a flea, by Borrichius. From the acts of Copenhagen.

PLINY represents to us a Greek philosopher, whose occupation, for several years together, was to measure the space ſkipped over by fleas. Without giving into such rediculous researches, I can relate an anecdote which chance discovered to me in regard to that insect. Being sent for to attend a foreign lady, who

was greatly afflicted with pains of the gout, and having staid by desire to dine with her, ſhe bad me take notice, after dinner, of a flea on her hand. Surprised at such discourse, I looked at the hand, and saw indeed a plump and pampered flea, sucking greedily, and kept fast to it by a little gold chain. The lady aſsured me, ſhe had nursed and kept the little animal at that time, full six years, with exceeding great care, having fed it twice every day with her blood, and when it had satisfied its appetite, ſhe put it up in a little box lined with silk. In a month's time, being recovered from her illneſs, ſhe set out from Copenhagen with her flea; but, having returned in about a year after, I took an opportunity of waiting upon her, and among other things, aſked after her little insect. She answered me with great concern, that it died through the neglect of her waiting woman. What I found remarkable in this story was, that the lady being attacked by chronical pains in the limbs, had recourse in France to a mercurial salivation during six weeks; and all this time the flea had not ceased to feed upon her blood imbued with the vapours of mercury, and yet was not the worse for it, which ſhows how much its constitution is different from that of the louse, to which mercury is a mortal poison.

POETRY.

ADDRESS TO THE ROSE.

For the Bee

Go lovely rose, to Mary's bosom go,
That bosom fair as is the opening morn,
When it doth nature with her sweets adorn,
And spreads her beauties upon all below.

Still art you sprinkled with the morning dew,
Seeming in tears to mourn the absent sun,
Who yesterday his course so glorious run,
And gave your opening beauties to our view.

But she will kiss those pearly drops away,
And with her breath thy sweets shall sweeter seem
Than shepherd lads and shepherd's lasses deem
The fresh sprung violets of the month of May.

Those sweets will pleasing be, tho' you decay.
So time to Mary's mind perfection brings,
That should frail beauty roam on airy wings,
She still may charm us as at break of day.

B. B.

TO LOVE.

OF HOW, or fiend, or angel, by what name
Shall I address thee? how express thy powers?
Strange compound of extremes, of heat and cold,
Of hope and fear, of pleasure and of pain!
Most credulous infidel! now trusting nought,
Now anchoring on a feather; craving all;
With nothing satisfied; perplex'd with doubts,
Yet dreading to be sure; surcharg'd with thought,
Of speech incapable; in absence curst,
Yet eager still to rush on certain pain!
Tho' blind they call thee, yet I've known thee, Love,
More keen and watchful than the sleepless eye
Of that dread serpent whose terrific glare
Hung like a comet o'er th' Hesperian boughs.
Nor ken of griping miser, nor of lynx;
Nor his whom poets feign'd with hundered eyes,
Argus, nor that majestic bird's which looks
Undazzled on the sun, looks half so sharp,
So vigilant as thine. All seeing Love,
No look, no motion, gesture, deed, or word,

No nor the secret councils of the heart,
Can 'scape thy scrutiny. How wretched thou,
If aught thou spiest which thwarts thine ardent wish!
And, oh! how raviſh'd, if thou mark'st one line
Which tells the latent longings of the soul!
In that high fever, the delirious brain
Coins gaudy phantoms of celestial bliſs,
Of bliſs that never comes—for now, ev'n now,
Now, while love seeks and eyes the rainbow hues
With child-like rapture, and full fondly thinks
They ne'er ſhall fade, even now comes jealous fear,
With tottering fist, and thunders at the door.
At this rude noise alarm'd the dreamer starts;
Looks trembling round, and finds the vision fled.
Where now's th' angelic hue, the dimpl'd cheek,
The moistened eye ball, and the hidden bluſh
Or Love's delicious smiles? From dreams like these,
From airy joy's, he wakes, to real pain.
Quick to his sight up springs, in long array,
A tribe of deviliſh ills—the cold reply,
Th' unanswer'd question, the aſsenting nod
Of dull civility, the careleſs look
Of blank indifference, the chilling frown,
That freezes at the heart, the stony eye
Of fixt disdain; or more tormenting gaze
Bent on another. These, with all the train
Of fears and jealousies that wait on Love,
Are no imagin'd grief; no fancied ills
These; or, if fancied, worse than solid woes.
Such art thou, Love; then who that once has known
Thy countleſs sands, and rocks that lurk beneath,
Would ever tempt thy smiling surface more?
Long toſs'd on stormy seas of hopes and fears,
How willingly at last my wearied soul
Would seek a ſhelter in forgetfulneſs!
O bland forgetfulneſs, Love's sweetest balm,
Come, rouse thee from thy bed, if still thou sleep'st
On Lethe's ſhore, come take this willing breast,
And fold it in thine arms; thro' all my veins
Thy dead'ning pow'rs infuse, close up each gate
And avenue to Love, purge off the slime
That clogs this spirit, which fain would wing its flight
To sense, to reason, liberty, and law. P. H

Hints respecting various plants that may be useful in domestic economy, by Arcticus

To the Editor of the Bee

Sir,

I propose dedicating this letter, to the queries in your last letter with some miscellaneous hints on plants that may be cultivated with advantage in Great Britain, or which at least merit a fair trial.

Polygonum *Tataricum.*

First, The species of wild Siberian buck wheat, which you inquire after with so much anxiety, from having been told of its being perennial, and a promising fodder for cattle, is the *polygonum Tataricum* of Linnæus, called by the Ruſsians *kirlik*, and the Tartars *dikuschka.*

It grows wild in several parts of Siberia; and in some is cultivated, as it remains several years in the ground without labour or expence. So far is certainly true; but still I cannot take upon me to say that it is a perennial plant, but on the contrary suspect its being an annual.

This apparent paradox may be explained in the following manner, and I suppose will be found to be the real fact; that as the seeds of this polygonum ripen very unequally, those first come to maturity, are ſhaken out with the wind, before what may be called *the latter crop*, is reaped, so as to reproduce the grain for several years without freſh sowing, although it gradually thins, till it totally disappears, if cut down yearly.

The Siberians gather in the grain as an article of food, prepared in the following manner. They roast it a little in an iron pan, after swelling it by steeping in cold water; a double operation which makes the huſks separate readily during the grinding in their wooden mortars, which are more common than mills. The grain thus

treated is semitransparent, of a yellowiſh colour, and has a very agreeable taste when boiled up in milk, in form of porridge, their usual way of eating it, as I have been informed by a friend residing in Siberia.

The POLYGONUM *convolvolus.*

But there is another species of polygonum, *viz*, the *P. convolvolus* of Linnæus, which I think merits a fair trial with you, and promises to be useful in some parts of Scotland, from its poſſeſsing the following qualities.

First, it is a hardy Siberian plant like the former, which is not hurt by even a much severer cold than any it can meet with in your island.

Second, it will grow on the poorest grounds.

Third, because the grain *ripens altogether*, which facilitates much the getting of it in, in northern situations.

Fourth, because it carries more grain than the polygonum Tataricum, the wild Siberian buck wheat you inquired after.

It likewise grows wild like the other, in several parts of Siberia, particularly about Murom on the Okka, and might probably be an acquisition to some of the more northern sterile lands of Scotland.

I send you the seeds of the polygonum Tataricum, and ſhall write to Siberia for the other. *

* Some of the seeds of the polygonum Tataricum, which accompanied this letter, were sown as soon as poſsible after they arrived. They came up very readily, and are now growing vigorously. In corroboration of this correspondent's opinion, the plant has the habit, and much the appearance of an annual.

I am much obliged to this valuable correspondent for his attention in this and every other respect; and ſhall exert myself to make the best use in my power of his communications. The *polygonum convolvolus*, is found in some places of this country, and seeds of it may probably be got here. It never attracted my notice as a plant promising to be of much utility; but I ſhall now examine it with more attention. *Edit.*

I shall now finish my letter with a few miscellaneous hints on northern plants, which will probably for that reason suit your climate, and which I think merit trial from useful purposes they may be applied to.

Trifolium *hybridum.*

Do you cultivate in Scotland the best of all our northern grasses, and the most hardy, the trifolium hybridum, a most excellent white clover? *.

Robinia *ferox, and* Ferula *asafœtida.*

Has the robinia ferox succeeded for impenetrable hedges, the seeds of which I sent over, with many other Siberians, to my old correspondent, the late worthy professor of botany †? I should likewise be happy to know if my ferula asafœtida is still alive, and has produced good seeds, of which he was so proud twelve years ago, when that plant presented the new and curious phenomenon of flowering in Europe, to which it had till then been a stranger. The true asafœtida was a valuable acquisition to Great Britain, if it has been cultivated with success; for the good doctor had it growing in the open air, and mentions in the Philosophical Transactions of London (where he has given a fine plate of the plant in flower)

* Answer: I do not know that it is ever cultivated here. Some of the seeds of it will prove acceptable. *Edit.*

† I was so sensible of the value of this plant for the purpose here hinted at, when I read the account of it in the *Flora Rossica*, lately presented by the Empress of Russia to the Royal Society of Edinburgh, that I wrote by post to Arcticus, requesting the favour of him to procure me some seeds of it. Since receiving the above I have made inquiry for it in the Botanic garden; but do not find it there. *Edit.*

the fetid juice which forms the famous drug, having appeared in considerable quantity *.

The plants we reserved for this country, have all periſhed, so that if Britain poſſeſs it still it is unique in Europe.

ROBINIA *pygmea.*

I forgot to mention above, when inquiring after the robinia ferox, another species of it, viz, the pygmea, which might poſsibly be employed for some useful purpose by your industrious people, since the lazy wandering Tartars about Krasnojarſk in Siberia, obtain a species of coarse thread from it †.

You will observe, Mr Editor, as I am very little a sanguine projector, and very little fired with modern enthusiasm of any kind, poſsibly from living so long amongst ice and snow, that I only propose for trial such of our hardy Siberian plants as are likely to succeed in your northern sterile, and waste lands; hoping that the more southern and fertile, are too well employed to be the theatre of experiment, I ſhall only depart from that maxim in mentioning a Jamaica plant, which however has been tried in Sweden by Linnæus's advice, although I have not heard of its succeſs there as yet, being long im-

* I am happy to be able to inform this correspondent that the Ferula asafœtida is still alive in the Botanic garden here. It has several times produced ripe seeds, by which means the plant has been multiplied, so that there are now a good many plants of it here in a very thriving condition. It bears our hardest winters quite well.

Edit.

† I do not know that this plant has been introduced into Britain. Will be obliged to any correspondent for imformation concerning it, if it has. *Edit.*

ported after the death of that great man, who certainly would not have recommended any thing to his country, which had not a probability of succeeding.

Zizania *aquatica.*

I allude to the *zizania aquatica* of Jamaica, a plant which bears a grain like rice, equally eatable, and which grows in wet places where nothing is produced but reeds. Such sort of experiments which cost little or nothing, and that do not require a productive soil, are certainly the most valuable, in a country abounding already with most of the useful plants of the known world.

I am much of your *solid opinion* on all these subjects, that we ſhould endeavour to do all the good we can in morals and in physics, *but hazard nothing from wild theory in either the one or the other.* By persisting in that wise plan, though it is scarcely poſsible you can stem the torrent of folly in many cases, in an island too much abounding with good things, and bleſsings of all kinds, to be sober; yet you may have the good fortune to moderate its course, which is doing a great deal; for my own opinion, I really think from my knowledge of the continent as well as our island, that if ever the beautiful simple allegory of holy writ, was applicable to a country, it is to Great Britain at present, '*and they waxed fat and kicked.*'

Vegetable soap.

A vegetable soap would certainly be as great a curioſity with you, as the vegetable silk you inquire after, and such a one actually exists in the northern parts of Siberia, known to the Ruſsians by the name of *Tatarſkoi muilo* or Tartar's soap, from its being used as such by the Tartars about Krasnojarſk near Irkutzk.

The plant is the *lichnis chalcedonica* of Linnæus, and it is the crown of the flower which is employed as soap *.

To preserve fruit trees from caterpillars.

Have you tried in Scotland a mode of guarding fruit trees against the caterpillar, so much recommended; which is to wrap in spring a rag dipped in train oil round the top of the trunk? the leſs valuable the oil for other

* We have the lychnis chalcedonica, the scarlet lychnis vulgo, in abundance in our gardens. It is now coming into flower. I have tried it in every way that seemed likely to answer with me, but have not been able to discover any symptoms of its being useful as a detergent. If any of my readers ſhall prove more succeſsful in their trials with it, I will be glad to hear of these. It is probable the inhabitants of Siberia may content themselves with some poorer substitutes for soap than the more wealthy, and I presume more cleanly inhabitants of Britain.

Various other detergents.

In former times even we of Britain employed various substances, both vegetable and animal, as detergents, which now have fallen into disuse; and soap has come into more general use.

Urine was long employed for that purpose, insomuch that the general name for it among the vulgar, WASH, which now, as falling into disuse, deserves to be preserved, was derived from this property. Whence the same substance derived its other vulgar name, MASTER, is not so easy to conceive.

Blood is likewise, in certain circumstances, a powerful detergent, as also *milk*, especially when sour, though in a leſser degree.

Cow dung has been also often used as a sort of detergent in the operation called *bucking*, in the proceſs of bleaching, among the country people.

Among vegetable substances, all the farinaceous grains, or seeds, when grinded into meal, are well known to be among the best and mildest detergents for the human ſkin. Hence the use of *almond powder*, and various others as cosmetics.

Raw potatoes operate strongly in the same manner; and no doubt many other substances. But all of these, unleſs upon the human ſk in, are much inferior in power to soap. *Edit.*

purposes from rancidity, the better it will answer for the proposed experiment *.

Such are a few of the well intended hints thrown out by the zealous citizen of Great Britain who signs himself your correspondent, ARCTICUS.

HINTS ON DOMESTIC ECONOMY.

SIR, *To the Editor of the Bee.*

As I see (in the third number of the Bee) you have made choice of an excellent piece for the improvement of morality, from the Pennsylvanian almanack, I have herewith sent you a few observations, from an old tradesman to a young one, which I have collected from newspapers, from the year 84, till 87, which if they were duly attended to, by tradesmen of every denomination, would deprive the lawyers and doctors of much money, needlesly thrown away, and might teach the trading part of your readers, of the meanest capacity, and even the most learned, to become rich, and useful members of society. I am your humble servant MERCATOR

To young tradesmen.

Every one of you gentlemen, ought to consider himself as having the affairs of a little republic to manage. You have a treasury to provide for; you have ways and means to seek; you have constituents whose good graces you must cultivate; you must take such care that your bills shall always pass, and above all, you must be ready to answer all demands of your opponents, and keep your civil list free from arrears. Never trust to the second quarter for the payment of the first; and as in kingdoms and states, it is absolutely necessary to have such an ad-

* Has this been tried by any of the readers of the Bee, and with what success? *Edit.*

ministration, as ſhall maintain the dignity and the conſequence of the nation in the eyes of ſurrounding powers, ſo it becomes you to make yourſelves dreaded, and yet reſpected by your fellow tradeſmen, not to raiſe their envy nor their contempt by flaſhy extravagance, but to diſtinguiſh yourſelves by induſtry, probity and punctuality.

Of punctuality it is impoſsible to ſay too much. You muſt be ſenſible, that what you like in others, others wil look for in you.

Honeſtus is a tradeſman diſtinguiſhed for this happy quality. No man calls twice upon him to ſettle any buſineſs which can poſsibly be done at once; and he is always more ready to pay than others are to receive. His word is never given, but where he not only ſeriouſly means to keep it, but alſo knows that, humanly ſpeaking, he has it in his power to keep it. Hence there are few men who would not as confidently take his word as his bond; and if his character were as well known in courts of juſtice as it is in trade, I believe his ſimple affirmation would be as valid as an oath, if the cuſtoms of the place did not forbid it.

Now mark the different character of Tom Tedious. He never keeps his time, yet he always is allowed to appoint what time he pleaſes; time and place are always left to him, but the place he forgets, and the time he purpoſely out ſtays. If he had 100 guineas in his pocket, which he had no occaſion for, and you wanted a bill of thirty ſhillings paid, your ſervant muſt call again, aye, again and again, before it is done. By this mode of proceeding he has ſo completely diſguſted all his brethren, that no one wiſhes to deal with him; and for his word, no man will take the word of him who never keeps a promiſe.

The main drift of all my advices, is to prevent those distreſses which are now so frequent among tradesmen. Our papers are crowded with bankrupts, and the greatest part of them young ones, a circumstance which to me appears alarming in the following point of view. As the old must soon die, whom ſhall we find to succeed them, and keep up the spirit of trade in this country? If extravagance, folly, and levity, are the characteristics of you tradesmen, where ſhall we find proper succeſsors to those eminent characters, who from small beginnings, much smaller, gentlemen, than some of you have begun with, have risen to be heads of their several profeſsions, and who have been dignified with those great offices and honours that are conferred on distinguiſhed probity and worth? On your conduct now, therefore, much depends on a national view of the matter. It is not the man who makes a long speech to the populace, and catches the applause of the vulgar by an affected contempt of courts, and places which in fact he wiſhes to have, that is to be accounted a patriot: for repeated experience has convinced us, that such men are no better than impostors. No, you, gentlemen, are the patriots of this nation. It is you who are expected to support her glory, by preserving the spirit of generous commerce; it is you who, while you enrich yourselves, pour wealth into your country, provide for the industrious poor, and make your nation courted by all others as a commercial nation.

A tradesman who has raised a petty ſhop, by slow industry and probity, to a capital warehouse, and whose character adds consequence to the name of a Britiſh merchant, he is the true patriot. Those will be happy that are under him; and from superior ranks eyed with pleasure. Look round and mark the potency of a great name, a name raised by probity, industry, and honour, to rank and munificence. See what power that man has—what confidence the world puts in such men; and

how the voice of slander, ever so loud, cannot so much as be heard. Think on such men; follow their steps, and be happy!

to be continued.

Observations on the instinct of animals.

From Reid's esays.

We come into the world ignorant of every thing, yet we must do many things in order to our subsistence and well being. A new-born child may be carried in arms, and kept warm by his nurse; but he must suck and swallow his food for himself. And this must be done before he has any conception of sucking and swallowing, or of the manner in which they are to be performed. He is led by nature to do these actions, without knowing for what end, or what he is about. This we call instinct. . . .

In the animals we are best acquainted with, and which we look upon as the more perfect of the brute creation, we see much the same instincts, or mechanical principles of action, as in the human kind, or very similar ones, suited to the particular state and manner of life of the animal.

Besides these, there are, in brute animals, instincts peculiar to each tribe, by which they are fitted for defence, for offence, or for providing for themselves and for their offspring.

It is not more certain, that nature hath furnished various animals with various weapons of offence and defence, than that the same nature hath taught them how to use them; the bull and the ram to butt, the horse to kick, the dog to bite, the lion to use his paws, the boar his tusks, the serpent his fangs, and the bee and the wasp their sting.

The manufactures of animals, if we may call them by that name, present us with a wonderful variety of instincts belonging to particular species, whether of the social or the solitary kind—the nests of birds, so similar in their situation and architecture in the same kind, so various in different kinds—the webs of spiders and of other spinning animals—the ball of the silk worm—the nests of ants and other mining animals—the combs of wasps, hornets, and bees,—the dams and houses of beavers.

The instinct of animals is one of the most delightful and instructive parts of a most pleasant study, that of natural history; and deserves to be more cultivated than it has yet been.

Every manufacturing art among men was invented by some man, improved by others, and brought to perfection by time and experience. Men learn to work in it by long practice, which produces a habit. The arts of men vary in every age, and in every nation, and are found only in those who have been taught them.

The manufactures of animals differ from those of men, in many striking particulars.

No animal of the species can claim the invention. No animal ever introduced any new improvement, or any variation from the former practice. Every one of the species has equal ſkill from the beginning, without teaching, without experience or habit. Every one has its art by a kind of inspiration. I do not mean that it is inspired with the principles or rules of the art, but with the ability and inclination of working in it to perfection, without any knowledge of its principles, rules, or end.

The more sagacious animals may be taught to do many things which they do not by instinct. What they are taught to do, they do with more or leſs ſkill, according to their sagacity and their training. But, in their

own arts, they need no teaching nor training, nor is the art ever improved or lost. Bees gather their honey and their wax, they fabricate their combs, and rear their young at this day, neither better nor worse than they did when Virgil so sweetly sung their works.

The work of every animal is, indeed, like the works of nature, perfect in its kind, and can bear the most critical examination of the mechanic or the mathematician. One example from the animal last mentioned may serve to illustrate this.

Bees, it is well known, construct their combs with small cells on both sides, fit both for holding their store of honey, and for rearing their young. There are only three poſsible figures of the cells, which can make them all equal and similar, without any useleſs interstices. These are the equilateral triangle, the square, and the regular hexagon.

It is well known to mathematicians, that there is not a fourth way poſsible, in which a plane may be cut into little spaces that ſhall be equal, similar, and regular, without leaving any interstices. Of the three, the hexagon is the most proper, both for conveniency and strength. Bees, as if they knew this, make their cells regular hexagons.

As the combs have cells on both sides, the cells may either be exactly opposite, having partition against partition, or the bottom of a cell may rest upon the partitions between the cells on the other side, which will serve as a buttreſs to strengthen it. The last way is best for strength; accordingly, the bottom of each cell rests against the point where three partitions meet on the other side, which gives it all the strength poſsible.

The bottom of a cell may either be one plane, perpendicular to the side partitions, or it may be composed

of several planes, meeting in a solid angle in the middle point. It is only in one of these two ways that all the cells can be similar without losing room. And, for the same intention, the planes of which the bottom is composed, if there be more than one, must be three in number, and neither more nor fewer.

It has been demonstrated, that, by making the bottoms of the cells to consist of three planes meeting in a point, there is a saving of material and labour no way inconsiderable. The bees, as if acquainted with these principles of solid geometry, follow them most accurately; the bottom of each cell being composed of three planes which make obtuse angles with the side partitions, and with one another, and meet in a point in the middle of the bottom; the three angles of this bottom being supported by three partitions on the other side of the comb, and the point of it by the common intersection of those three partitions.

One instance more of the mathematical skill displayed in the structure of a honey-comb, deserves to be mentioned.

It is a curious mathematical problem, at what precise angle the three planes, which compose the bottom of a cell, ought to meet, in order to make the greatest possible saving, or the least expence of material and labour.

This is one of those problems, belonging to the higher parts of mathematics, which are called problems of maxima and minima. It has been resolved by some mathematicians, particularly by the ingenious Mr Maclaurin, by a fluxionary calculation, which is to be found in the transactions of the royal society of London. He has determined precisely the angle required; and he found by the most exact mensuration the subject could admit, that it is the ve-

ry angle in which the three planes in the bottom of the cell of a honey-comb do actually meet.

Shall we aſk here, who taught the bee the properties of ſolids, and to reſolve problems of maxima and minima? If a honey-comb were a work of human art, every man of common ſenſe would conclude, without heſitation, that he who invented the conſtruction, muſt have underſtood the principles on which it is conſtructed.

We need not ſay, that bees know none of theſe things. They work moſt geomatrically, without any knowledge of geometry; ſomewhat like a child, who, by turning the handle of an organ, makes good muſic, without any knowledge of muſic.

The art is not in the child, but in him who made the organ. In like manner, when a bee makes his combs ſo geomatricallv, the geometry is not in the bee, but in that Great Geometrician, who made the bee, and made all things in number, weight, and meaſure!

TO CORRESPONDENTS.

The laboured apology of *Speculator* is received. And though the Editor is reſolved to keep clear from diſputes on matters of that ſort, yet for the ſake of impartiality, he will inſert, either in whole or in ſubſtance in an abridged form, the principal arguments here offered; and there the matter muſt reſt: for this miſcellany ſhall never be made the vehicle of controverſial altercation, which on the plan here begun, might be ſpun out for ages, without coming to any concluſion that could benefit mankind.

The letter of *Cynic* is received. The Editor is ſorry he ſhould have had any cauſe of diſguſt. Had he been as explicit on former occaſions as in his laſt letter, this would have been entirely prevented. He may reſt aſſured that neither he nor any other perſon who is equally explicit, and gives the ſame alternative he allows, ſhall ever have reaſon to complain of their wiſhes not being complied with.

The favours of *Contemplator* are received, and ſhall be inſerted with the firſt opportunity.

*** *Acknowledgements to correſpondents ſtill neceſſarily deferred other.*